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**PSYCHOPHARMACOLOGY
ABSTRACTS**

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION

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Carrie Lee Rothgeb, *Editor*

Bette L. Shannon, *Managing Editor*

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ABSTRACTS

PRECLINICAL PSYCHOPHARMACOLOGY

01 CHEMICAL SYNTHESIS, ISOLATION AND CHARACTERIZATION

243340 Thielemann, Horst. Wasserturmstrasse 10, DDR-36 Halberstadt, Germany /On the thin layer chromatography of some nonbarbiturate hypnotics and ataractics./ Zur Dunnschichtchromatographie einiger Hypnotica (Nichtbarbiturate) und Ataraktika. Scientia Pharmaceutica (Wien). 43(2):91-100, 1975.

Common nonbarbituric hypnotics were analyzed using thin layer chromatography. Base layers used were aluminum oxide with or without binders, and the solvents used were chloroform acetone, isopropanol chloroform, petroleum ether, chloroform cyclohexane pyridine and chloroform ethylether. Resulting chromatographic values for each solvent combined with the following drugs are presented: apronalide, bromisoval, carbromal, acetylcarbromal, ethinamate, hexapropymate, meprobamate, centalun, methylprylon, dihydroprylon, glutethimide, thalidomide and methaqualone. In addition, the main pharmacological effects, uses and indications of these hypnotics are reviewed. 67 references.

246317 Enever, R. P.; Li Wan Po, A.; Millard, B. J.; Shotton, E. Pharmaceuticals Dept., School of Pharmacy, Univ. of London, Brunswick Square, London, WC1N 1AX, UK Decomposition of amitriptyline hydrochloride in aqueous solution: identification of decomposition products. Journal of Pharmaceutical Sciences. 64(9):1497-1499, 1975.

The decomposition of amitriptyline hydrochloride upon autoclaving in a buffered solution (pH 6.8) is investigated. Three major decomposition products (3-(propa-1,3-dienyl)-1,2,4,5-dibenzocyclohepta-1,4-diene, dibenzosuberone, and 3-(2-oxoethylidene)-1,2,4,5-dibenzocyclohepta-1,4-diene) were detected and identified by chromatographic and spectroscopic techniques. Evidence is presented that the latter two compounds are formed by further oxidation of 3-(propa-1,3-dienyl)-1,2,4,5-dibenzocyclohepta-1,4-diene, and a possible decomposition pathway is outlined. 3 references. (Journal abstract)

247586 Rogers, M. E.; Sam, Joseph. Department of Medicinal Chemistry, School of Pharmacy, University of Mississippi, University, MS 38677 3-Arylquinolizidines, potential antidepressant agents. Journal of Medicinal Chemistry. 18(11):1126-1130, 1975.

The synthesis, structure elucidation and pharmacological evaluation of some 3-arylquinolizidines as semirigid phenethylamines are described. Many of the derivatives were observed to possess antidepressant properties when tested in mice. Some anticonvulsive effects were also noted. Additional studies are under way in order to more clearly define the relationship of the biological activity to the chemical structure of this series of compounds. 15 references. (Author abstract modified)

248162 Borison, Richard L.; Mosnaim, Aron D.; Sabelli, Hector C. Department of Pharmacology, University of Health Sciences, Chicago Medical School, 2020 West Ogden Avenue, Chicago, IL 60612 Brain 2-phenylethylamine as a major mediator for the central actions of amphetamine and methylphenidate. Life Sciences (Oxford). 17(8):1331-1344, 1975.

2-Phenylethylamine (PEA) was measured in rabbit brain by gas liquid chromatography. D-Amphetamine sulfate (0.65 mg/Kg) initially reduced brain PEA levels to one third of its usual content (30 min) and subsequently doubled brain PEA (4 hr). Brain PEA levels were reduced (30 min) and subsequently increased (tenfold at 4 hr) by d-amphetamine sulfate (13 mg/kg); tolerance to these two effects was observed in rabbits treated for 3 days with d-amphetamine. Methylphenidate HCl (30 mg/kg) but not L-amphetamine sulfate (0.65 mg/Kg and 13 mg/Kg) induced a small, nonsignificant lowering of brain PEA (30 min) followed by a marked augmentation (4 hr) of brain PEA (30 min) followed by a marked augmentation (4 hr) of brain PEA content. L-amphetamine (30 min or 4 hr prior) increased the recovery of labeled PEA from the brain of rabbits injected intraventricularly with labeled phenylalanine, and reduced the recovery of labeled PEA after its intraventricular injection, suggesting that d-amphetamine accelerates both the synthesis and the disposition of brain PEA. Pretreatment with alpha-methyl dopa (which depletes PEA and other brain amines) or with an alpha-methyl dopa hydrazine (which selectively reduces brain PEA content by inhibiting decarboxylase in peripheral tissues only) markedly reduced the CNS effects of d-amphetamine (behavioral stimulation in mice and rabbits, anticonvulsant effect in mice); these decarboxylase inhibitors enhanced the amphetamine like effects induced by PEA in mice pretreated with a monoamine oxidase inhibitor. The ability of PEA depleters to selectively block the stimulant effects of d-amphetamine, together with the close structural and pharmacological similarities between amphetamine and PEA, and marked influence of amphetamine administration upon PEA brain levels, synthesis and metabolism, suggest that many of the central actions of amphetamine may be mediated by endogenous PEA. 33 references. (Author abstract)

248537 Fowler, J. S.; MacGregor, R. R.; Wolf, A. P.; Ansari, A. N.; Atkins, H. L. Chemistry Department, Brookhaven National Laboratory, Upton, NY 11973 Radiopharmaceuticals. 16. Halogenated dopamine analogs. Synthesis and radiolabeling of 6-iododopamine and tissue distribution studies in animals. Journal of Medicinal Chemistry. 19(3):356-360, 1976.

Catecholamine analogs which show specificity for the adrenal medulla are explored and evaluated as scanning agents which might be labeled with radioactive nuclides to allow external visualization of the adrenal medulla and abnormalities associated with adrenal medullary tissue. A simple halogenated derivative of dopamine, 6-iododopamine, was synthesized using two different methods. These synthetic sequences were applied to the radiolabeling of 6-iododopamine with carbon-11, iodine-131, and iodine-123. The tissue distribution of 6-iododopamine in mice, dogs, and rats was determined. The ratio of radioactivity (%/g) in the adrenal medulla - kidney in dogs increases from 3.45 at 2h postinjection to 33.3 at 24h postinjection. Thyroid uptakes in mice, dogs, and rats show that in vivo deiodination of 6-iododopamine is not significant. It is concluded that carbon-11-labeled 6-iododopamine, since it can be produced in exceedingly high specific activity, might be useful in studies where the chemical loading dose is important or when a very high specific activity material is required. It is further noted that 6-iododopamine, while retaining the structural features of natural dopamine, possesses rather large steric perturbation caused by the iodine substituent ortho to the ethylamine side chain. A study of this molecule's biological activity as well as its ability to function as a substrate for vari-

ous enzymes involved in catecholamine metabolism is recommended as of interest in evaluating the importance of this part of the molecule to its interaction with the various enzymes involved in catecholamine metabolism. 18 references. (Author abstract modified)

248637 Schaeffer, James C.; Cho, Arthur K.; Fischer, Joseph F. Department of Pharmacology, Center for Health Sciences, University of California at Los Angeles, Los Angeles, CA 90024 **Inhibition of synaptosomal accumulation of l-norepinephrine II: n-aryloxyalkylphenylamines, quaternary d-amphetamines, and 3-aryloxypropylamines.** *Journal of Pharmaceutical Sciences*. 65(1): 122-126, 1976.

A study was conducted to develop a specific inhibitor of the l-norepinephrine uptake mechanism by employing the nonclassical inhibitor principle. The inhibitory potencies of a series of N-substituted phenylamines on the synaptosomal uptake of l-norepinephrine were found to be similar to those of the corresponding amphetamines. Quaternization of N,N-dimethyl-d-amphetamine diminished, but did not abolish, its inhibitory potency, indicating that a permanently charged cation is also effective. Since the addition of an aromatic moiety at the end of a four atom chain originating at the nitrogen of amphetamine or phenylamine significantly increased inhibitor strength, several 3-aryloxypropylamines and 4-phenylbutylamine were tested, but they were much weaker inhibitors than d-amphetamine. Thus, the observed increase in inhibitor potency apparently was not simply the result of a specific interaction of the nonmimic portion of the N-substituted amphetamines or phenylamines. 14 references. (Author abstract modified)

248949 Grol, C. J.; Rollema, H. Laboratorium voor Farmaceutische en Analytische Chemie, Ant. Deusinglaan 2, Groningen, The Netherlands **Synthesis and neuroleptic activity of isomeric thieno(1,4)benzothiazines.** *Journal of Medicinal Chemistry*. 18(8):857-861, 1975.

The synthesis and preliminary pharmacology of thienobenzothiazine analogs of promazine, chlorpromazine, and trifluorpromazine are reported. All compounds were screened for neuroleptic activity in mice and rats. For the active compounds lowest active doses in the antiamphetamine test were determined. Activity appeared to be dependent on the mode of annelation of the thiophene molecule: compounds bearing the same substituent and side chain with the thiophene molecule in 2,3 and 3,4 annelation were active, while those compounds with a 3,2 annelation seemed to be devoid of activity at the given dose. 6 references. (Author abstract modified)

249035 Marzullo, Giovanni; Friedhoff, Arnold J. Millhauser Laboratories, Department of Psychiatry, New York University School of Medicine, New York, NY 10016 **Catechol-O-methyltransferase from rat liver: two forms having different meta:para methylation ratios.** *Life Sciences* (Oxford). 17(6):933-941, 1975.

A study is reported in which cytoplasmic catechol-O-methyltransferase activity from rat liver was resolved by gel filtration into two enzymes: a major form having an estimated molecular weight of 23,000 and a minor one of 45,500. The relative abundance of these forms in liver is about 5:1, respectively. Microsomal catechol-O-methyltransferase constituted only 2% of the total liver activity. After solubilization by sonication, most of the microsomal enzyme showed a molecular weight in excess of 100,000, but some 23,000 weight enzyme was also released. The bound enzyme thus may represent an aggregate form of the soluble activity. The two cytoplasmic enzymes differ in several properties, including pH optima and thermal

stability. The two forms also differ in the extent of methylation of the para hydroxyl group, the larger enzyme having a meta:para methylation ratio twice that obtained with the smaller form. It is suggested that variations in the ratio of meta and para methylation in humans may reflect a genetic difference with regard to the distribution of catechol-O-methyltransferase isozymes having different abilities to methylate the para position. 21 references. (Author abstract modified)

249188 Lin, Reng-Lang; Narasimhachari, Nedathur. Thudichum Psychiatric Research Laboratory, Galesburg State Research Hospital, Galesburg, IL 61401 **N-methylation of 1-methyltryptamines by indolethylamine N-methyltransferase.** *Biochemical Pharmacology* (Oxford). 24(11-12):1239-1240, 1975.

Two 1-methyl derivatives of tryptamine, 1-methyltryptamine (1-Met) and 1-methyl-N-methyltryptamine (1-MeNMT) were used as substrates in a study of the relationship between the structure of the substrate and the activity of the enzyme. The effects of N,N-dimethyltryptamine (DMT), bufotenin, 1-methyl-N,N-dimethyltryptamine (1-MeDMT) and S-adenosylhomocysteine (SAH) on the activity of the enzyme were also examined. Quantitation of 1-MeNMT and 1-MeDMT by monitoring the ions at m/e 144 and 58, respectively, showed that both 1-MeT and 1-MeNMT are good substrates for the enzyme. Two samples of human serum incubated with 1-MeNMT yielded, respectively, 0.22 and 0.24 microg 1-MeDMT. The present experiments show that 1-methyltryptamines may undergo further changes with SAM dependent INMT to 1-MeNMT and 1-MeDMT. The major product of 1-MeT is 1-MeNMT with a 10% yield of the dimethylated tryptamine, 1-MeDMT. 13 references.

249328 Forrest, Irene S.; Green, Donald E.; Loeffler, Kay O.; Serra, Mauricio T. Veteran's Administration Hospital, Palo Alto, CA 94304 **Nature of new class of chlorpromazine (CPZ) metabolites in primate urines.** *Pharmacologist*. 17(2):267, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a study was presented which reported on the nature of a new class of chlorpromazine (CPZ) metabolites in primate urines. This new class of urinary CPZ metabolites appears to be the largest single group of CPZ derivatives. After removal of all conventional conjugated and unconjugated CPZ derivatives, these CPZ metabolites were either extracted as such with tetrahydrofuran or subjected to an acid hydrolysis which yielded known CPZ derivatives, among them in decreasing order, unchanged CPZ, its sulfoxide, and several dealkylated, hydroxylated and deaminated derivatives. The tetrahydrofuran extracts containing the intact compounds were used for attempts to elucidate their structure. From the chemical characteristics, viz. their inability to form quinoid free radical derivatives, their hydrolytic behavior, their solubility and thin layer chromatographic behavior, these CPZ metabolites appear to be "sulfoxonium" derivatives -- a class of biotransformation products not previously reported for CPZ or related drugs. (Author abstract modified)

249783 del Castillo, J.; Anderson, M.; Rubottom, G. M. Laboratory of Neurobiology, School of Medicine, University of Puerto Rico, San Juan, Puerto Rico 00905 **Marijuana, absinth and the central nervous system.** *Nature* (London). 253(5490):365-366, 1975.

Properties of thujone and tetrahydrocannabinol (THC), believed to be the active principles of *Artemisia absinthium* and

Cannabis sativa, respectively, are compared in view of reported similarities between psychological actions of absinth and marihuana. Both substances are terpenoid, derived from essential oils, and formed by similar biosynthetic mechanisms. Thujone and THC have similar molecular geometry and similar functional groups available for metabolism. It is postulated that both thujone and THC react with a common site of a pharmacological receptor without changing orientation or relative position of molecules. These oxygen atoms in each are thought likely to be the principal pharmacological binding sites because the primary metabolites from each are products of oxidation. It is hypothesized that both agents exert their psychotomimetic effects by interacting with a common receptor in the central nervous system. This hypothesis suggests new experimental approaches to study the pharmacology and toxicology of these and related compounds. 11 references.

250357 Rodgers, John R.; Horn, Alan S.; Kennard, Olga. University Chemical Laboratory, Lensfield Road, Cambridge, England **Antipsychotic phenothiazine drugs and the significance of the X-ray structure of promazine HCl**. *Journal of Pharmacy and Pharmacology* (London). 28(3):246-247, 1976.

Antipsychotic phenothiazine drugs and the significance of the X-ray structure of promazine HCl are discussed. The crystal and molecular structure of the unsubstituted drug promazine HCl was determined and certain of its molecular parameters compared with those of related drugs containing a -Cl, -CF₃, or -OCH₃ group at the 2 position. The 2 substituent appears not to produce a large effect on any of the molecular parameters than can be obtained from the crystal structures; however, the possibility exists that it may affect the presumed mobility of the phenothiazine ring system. It is noted that an investigation of this possibility will require other methods. It is concluded that the most likely effect of the 2 substituent is that of a direct interaction at the receptor site. 18 references.

250377 Hsu, Louise L.; Geyer, Mark A.; Mandell, Arnold J. Department of Psychiatry, University of California, San Diego, La Jolla, CA 92093 **Extrapineal amine N-acetylation in rat brain: regional and subcellular distribution and enzyme kinetics**. *Biochemical Pharmacology* (Oxford). 25(7):815-819, 1976.

The specific activity of N-acetyltransferase (NAT) is examined in 15 discrete regions of rat CNS as well as in six standard subcellular fractions from cerebellum, the region of highest NAT activity. Analysis by thin layer chromatography showed that (14C)N-acetyltryptamine and (14C)N-acetyl-beta-phenylethylamine are formed from the incubation of (14C)acetyl-CoA with tryptamine or beta-phenylethylamine, respectively, in the presence of rat brain extracts. The specific activity of the N-acetyltransferase in 15 discrete regions of rat CNS ranged from 1.64 plus or minus 0.05 nmoles of product formed/mg of protein/hr in cerebellum to 0.57 plus or minus 0.05 nmoles in occipital cortex with tryptamine as substrate, and from 2.80 plus or minus 0.30 nmoles in cerebellum to 0.91 plus or minus 0.13 nmoles in cervical cord with beta-phenylethylamine as substrate. Comparison of the regional specific activities in the presence of the respective substrates yielded a correlation coefficient of 0.83. In cerebellum N-acetyltransferase activity appears exclusively in cytosol. At two stages of purification (i.e. after bio-gel fractionation as well as after ammonium sulfate precipitation), the enzyme exhibited biphasic kinetics with respect to acetyl-CoA in the presence of tryptamine on beta-phenylethylamine and with respect to either substrate in the presence of acetyl-CoA. 40 references. (Author abstract modified)

251176 Muller, Walter E.; Wollert, Uwe. *Pharmakologisches Institut der Universität Mainz, D 65 Mainz, Obere Zahlbacher Strasse, 67, Germany* **Interaction of benzodiazepine derivatives with bovine serum albumin -- I. gel filtration studies**. *Biochemical Pharmacology* (Oxford). 25(2):141-145, 1976.

The binding of 11 benzodiazepine derivatives to bovine serum albumin was determined by means of Sephadex gel filtration. The albumin binding of the substances was characterized by the percentage of drug bound, the binding constants *k*, *K*₁, and *m* the number of binding sites per albumin molecule, and the free binding energy. The binding of the benzodiazepines to bovine serum albumin (BSA) is discussed in respect to the binding of these drugs to human serum albumin (HSA). The following great differences in the binding behavior of both albumins for the benzodiazepines have been found: 1) the affinities of the binding of most of the drugs to BSA are exceptionally smaller than those to HSA, 2) two benzodiazepines lorazepam and clonazepam are bound to BSA in a higher extent than to HSA, 3) most of the benzodiazepines have two or three binding sites on the BSA molecule, in contrast to the single binding site on the HSA molecule. The binding of the benzodiazepines to BSA is positively influenced by the pH value of the solution in a similar way as found for HSA. The benzodiazepines are the first group of drugs known in which binding to both albumins differ so fundamentally. The reason for these large differences and their pharmacological significance are discussed. 28 references. (Author abstract)

251177 Muller, Walter E.; Wollert, Uwe. *Pharmakologisches Institut der Universität Mainz, D-65 Mainz, Obere Zahlbacher Strasse 67, Germany* **Interaction of benzodiazepine derivatives with bovine serum albumin -- II. circular dichroism studies**. *Biochemical Pharmacology* (Oxford). 25(2):147-152, 1976.

The interaction of benzodiazepine derivatives with bovine serum albumin (BSA) was studied by circular dichroism (CD) measurements. Most of the investigated benzodiazepines show biphasic extrinsic Cotton effects, which are largely influenced by raising pH from 6.60 to 8.20. Quantitative estimation of the CD data pointed out that there are several binding sites on the BSA molecule. The CD data do not differ very much from those found for the interaction of the drugs with human serum albumin (HSA). Therefore it is suggested that at least a part of the benzodiazepine binding sites on the BSA molecule has similar properties to the single binding site on the HSA molecule. The extrinsic Cotton effects of the benzodiazepines in the presence of BSA are influenced by fatty acids and sodium dodecyl sulfate in a similar way as by the pH value of the solution. This is explained by a similar influence of the substances and of pH on the protein conformation. 29 references. (Author abstract)

251180 Cauthen, Sally E.; Ellis, Robert D.; Larrison, Sherlyn B.; Kidd, Morgan R. Chemistry Department, Northeast Louisiana University, Monroe, LA 71201 **Resolution, purification and characterization of rabbit serum atropinesterase and cocainesterase**. *Biochemical Pharmacology* (Oxford). 25(2):181-185, 1976.

Atropinesterase and cocainesterase from commercially available, pooled rabbit serum have been resolved using conventional methods of enzyme purification. Using a sequence of ammonium sulfate fractionation Sephadex G-75 gel filtration and QAE-Sephadex ion exchange chromatography, atropinesterase was purified 750 fold and cocainesterase was purified 220 fold. The two enzymes have been characterized with respect to pH optima, Michaelis constants and substrate

specificities. Both hyoscyamine and scopolamine appear to function as substrates for atropinesterase; pH optima and Km determinations are reported for both substrates. Both cocaine and tropacocaine appear to function as substrates for cocaineesterase; pH optima and Km determinations are reported for both substrates with this enzyme. 18 references. (Author abstract)

251698 Chang, Chi-Deu; Coward, James K. Department of Pharmacology, Yale University School of Medicine, New Haven, CT 06510 **Analogues of S-adenosylhomocysteine as potential inhibitors of biological transmethylation. Synthesis of analogues with modifications at the 5'-thioether linkage.** *Journal of Medicinal Chemistry*. 19(5):684-691, 1976.

The synthesis of S-adenosylhomocysteine analogues, in which the 5'-thioether linkage is replaced by an oxygen or nitrogen isostere, is reported. These compounds were designed to be resistant to enzyme catalyzed hydrolytic cleavage of the 5'-substituent. These new analogues were evaluated as inhibitors of catechol-O-methyltransferase and tRNA methylases and found to have poor inhibitory activity. 38 references. (Author abstract modified)

251701 Lee, Cheuk-Man; Plotnikoff, Nicholas P. Division of Pharmacology and Medicinal Chemistry, Abbott Laboratories, North Chicago, IL 60064 **Antidepressant and anticonvulsant activity of 1-(5-phenyl-4-oxo-2-oxazolin-2-yl)-4-substituted piperazines.** *Journal of Medicinal Chemistry*. 19(5):731-733, 1976.

1-(5-Phenyl-4-oxo-2-oxazolin-2-yl)-4-substituted cinnamoyl-piperazines and 1-(5-phenyl-4-oxo-2-oxazolin-2-yl)-4-carbamoylpiperazine and derivatives were synthesized and evaluated for antidepressant activity in the mouse Dopa potentiation test. 1-(5-Phenyl-4-oxo-2-oxazolin-2-yl)-4-carbamoylpiperazine and derivatives were further evaluated for anticonvulsant activity in the audiogenic seizure test in mice. Several of the compounds had good activity when compared with pemoline. 10 references. (Author abstract modified)

02 DRUG DEVELOPMENT (PRECLINICAL SCREENING)

244316 Lippmann, Wilbur; Pugsley, Thomas A. Biochemical Pharmacology Department, Ayerst Research Laboratories, Montreal, Quebec, Canada **The effects of tandamine, a new potential antidepressant agent, on biogenic amine uptake mechanisms and related activities.** *Biochemical Pharmacology (Oxford)*. 25(10):1179-1186, 1976.

The effects of various thiopyrano (3,4-b)indoles and pyrano (3,4-b)indoles on norepinephrine (NE) and 5-hydroxytryptamine (5-HT) uptake were determined in mice. A thiopyranoindole, tandamine, was a potent inhibitor of tritiated NE uptake in the heart, and was relatively ineffective in potentiating the 5-hydroxytryptophan (5-HTP) behavioral syndrome. A pyranoindole and a thiopyranoindole blocked both tritiated NE and brain 5-HT uptake with activities greater than, or similar to imipramine. Structure/activity relationships for these two activities were determined. Tandamine was the most potent in antagonizing reserpine induced hypothermia and the guanethidine induced depletion of heart tritiated NE. The (-)-enantiomer of tandamine exhibited greater activity in blocking NE and 5-HT uptake. It is concluded that tandamine and certain of its congeners, differing chemically from the known tricyclic antidepressants, exert relatively selective stereochemical effects on NE and 5-HT uptake mechanisms. Such agents have potential as antidepressants. 44 references. (Author abstract modified)

245608 Fowler, Susan J.; Kellogg, Carol. Department of Psychology, University of Rochester, Rochester, NY 14627 **Ontogeny of thermoregulatory mechanisms in the rat.** *Journal of Comparative and Physiological Psychology*. 89(7):738-746, 1975.

The ability of infant rats to select a warm environment is studied as a function of postnatal age (birth to 13 days). Animals under 5 days showed no choice response (movement to warm compartment, 36 to 37 degrees Centigrade). Increasing the motor capabilities of the pups, by injecting L-3, 4 dihydroxyphenylalanine (L-dopa, 50 mg/kg), elicited a choice response 4 to 5 day old animals. Younger animals demonstrated no choice response even though they were capable of movement. No difference was found between animals treated with L-dopa and control animals in the magnitude of temperature change in pups isolated from their mothers for one hour. It is suggested that behavioral thermoregulatory mechanisms (heat seeking) exist before abilities for internal regulation are fully developed. 22 references. (Author abstract modified)

245612 Atin, Joseph; Gibbs, James; Holt, Jonathan; Young, Robert C.; Smith, Gerard P. Edward W. Bourne Behavioral Research Lab., New York Hospital-Cornell Medical Ctr., 21 Bloomingdale Rd., White Plains, NY 10605 **Cholecystokinin elicits the complete behavioral sequence of satiety in rats.** *Journal of Comparative and Physiological Psychology*. 89(7):784-790, 1975.

The role of cholecystokinin in the satiety sequence investigated in rats. The behavior of intact rats and rats with chronic gastric fistulas was observed and scored during a 60 minute test period, in which they were offered liquid diet after 17 hours of deprivation. Both displayed the normal sequence of behavior at the end of each meal: they stopped eating, engaged in grooming and explored briefly, and then rested or slept. A fixed behavior sequence is thus considered to characterize satiety in the rat. However, the cessation of feeding was not found to be a sufficient condition for the appearance of the rest of the sequence. Quinine adulteration of the liquid diet stopped sham feeding but did not elicit the complete sequence, while intraperitoneal injection of the intestinal hormone cholecystokinin during sham feeding did elicit the complete sequence. It is concluded that endogenous cholecystokinin is a satiety signal in the rat. 13 references. (Author abstract modified)

245614 Quartermain, David; Botwinick, Chaim Y. Department of Neurology, New York University School of Medicine, 550 First Ave., New York, NY 10016 **Effect of age of habit on susceptibility to cycloheximide-induced amnesia in mice.** *Journal of Comparative and Physiological Psychology*. 89(7):803-809, 1975.

The amnesic effects of cycloheximide (CYC) on habits of different durations were examined in a food motivated discrimination reversal task. Groups of C57BL/6J mice were injected 30 minutes before training, immediately upon training, or 3 days, 6 days, or 9 days after training. Retention was tested 24 hours after CYC treatment. The usual amnesic effect of CYC occurred in animals injected before training. No amnesia was apparent in animals injected immediately, 3 days, or 9 days after training. However, a reliable and reproducible amnesia occurred in the group injected 6 days after training. This amnesia could be reversed by pretest treatment with a monoamine oxidase inhibitor, pheniprazine. Pheniprazine, given 7 days after training, also enhanced retrieval of memory in saline, injected mice. 19 references. (Author abstract)

245929 Leibowitz, Sarah Fryer. Rockefeller University, New York, NY 10021 Pattern of drinking and feeding produced by hypothalamic norepinephrine injection in the satiated rat. *Physiology & Behavior*. 14(6):731-742, 1975.

An experiment involving injection of norepinephrine into the perifornical region of the anterior hypothalamus of satiated rats is reported. Injection of norepinephrine into the perifornical region of the anterior hypothalamus was found to elicit both drinking and feeding in satiated rats. Analysis of these behaviors revealed the following: 1) both responses were dose dependent; 2) the drinking response had a latency of around 1.5min and a duration of 2 to 3min. It was followed within a minute or two by eating, lasting approximately 20min and by a period of drinking suppression that lasted approximately 60min; 3) satiation from the ingestion process appeared to be a primary factor in terminating the elicited feeding response, whereas a time related factor was important in terminating the elicited drinking; 4) these ingestive responses produced by noradrenergic stimulation of the anterior perifornical hypothalamus were found to bear striking similarities to the rat's natural feeding behavior and premeal component of his natural food associated drinking behavior; 5) these noradrenergically elicited responses could not be observed with lateral hypothalamic stimulation, while only feeding was elicited by ventromedial hypothalamic stimulation; 6) the drinking induced by central noradrenergic stimulation, in contrast to that induced by peripheral beta-adrenergic stimulation, was unaffected by nephrectomy. 38 references. (Author abstract modified)

245930 Leibowitz, Sarah Fryer. Rockefeller University, New York, NY 10021 Ingestion in the satiated rat: role of alpha and beta receptors in mediating effects of hypothalamic adrenergic stimulation. *Physiology & Behavior*. 14(6):743-754, 1975.

Adrenergically elicited responses in rats, which bear striking similarities to its naturally motivated ingestive behaviors, are examined. It was found that both responses could be elicited by perifornical hypothalamic injection of l-epinephrine, which was actually found to be more potent than l-norepinephrine. In contrast, only feeding could be elicited by the alpha stimulant metaraminol, and neither feeding nor drinking could be elicited by hypothalamic injection of d-norepinephrine, l-isoproterenol, or dopamine. The threshold doses of l-epinephrine for eliciting reliable ingestive responses were quite low, namely, 0.8nmole for drinking and 0.2nmole for feeding. Pharmacological analysis of the ingestive behaviors induced by l-norepinephrine or l-epinephrine indicated that the eating response was mediated by alpha-adrenergic receptors, whereas the drinking response involved the synergistic action of both alpha-adrenergic and beta-adrenergic receptors. No evidence for the involvement of dopaminergic or cholinergic (muscarinic) receptors was obtained. A third adrenergically elicited phenomenon, suppression of drinking, was observed during and after the period of induced feeding. Analysis of this effect revealed its dependence solely upon alpha-adrenergic receptor activity. 44 references. (Author abstract modified)

246854 Byrd, Larry D. Division of Primate Behavior, Yerkes Regional Primate Research Center, Emory University, Atlanta, GA 30322 Contrasting effects of morphine on schedule-controlled behavior in the chimpanzee and baboon. *Journal of Pharmacology and Experimental Therapeutics*. 193(3):861-869, 1975.

Contrasting effects of morphine on schedule controlled behavior in the chimpanzee and baboon are reported. Schedule controlled key pressing was maintained in two chimpanzees

and three baboons under a multiple 10 minute fixed interval (FI 10min) 30 response fixed ratio (FR 30) schedule of food delivery. Characteristic rates and patterns of responding were maintained under the FI and FR schedules. The acute i.m. administration of morphine (0.1 to 3.0mg/kg) prior to selected 2 hour sessions increased mean rates of responding under the FI schedule in the chimpanzee, but decreased responding in the baboon. As a dose of 3.0mg/kg of morphine, responding under the FI schedule in the chimpanzee increased fourfold and responding in the baboon decreased to less than 25% of control levels. Mean response rates under the FR schedule were also increased by morphine in the chimpanzee but responding under the FR schedule was little affected in the baboon except at higher doses. Results show that morphine can markedly increase responding in a nonhuman primate, the chimpanzee, and that the behavioral effects of morphine in the chimpanzee are qualitatively different from the effects in monkeys. 24 references. (Author abstract modified)

247587 Rolsten, C.; Samorajski, T. Texas Research Institute of Mental Sciences, Houston, TX Chlorpromazine, catecholamines and aging in mice. *Gerontologist*. 15(5):23, 1975.

In a paper given at the 28th meeting of the Gerontological Society, October 1975, in Louisville, Kentucky, chlorpromazine, (CPZ) catecholamines and aging were studied in mice. Ten month old female C57BL/10 mice were divided into a control group and two experimental subgroups for oral biweekly treatment with placebo and 5 and 10mg/kg of CPZ, respectively. The animals were weighed and tested at regular intervals for locomotor activity, hexobarbital and sodium barbital sleeping time and urinary excretion of 4-hydroxy-3-methoxyphenylglycol (MOPEG). There were significant drug and age dependent differences in running activity and Na-barbital sleeping time and only age dependent differences in urinary MOPEG. At the end of 20 months the animals were sacrificed for histological and neurochemical analysis of selected brain regions. There was a change in the endogenous level of norepinephrine but not dopamine in the forebrain of the CPZ treated mice. The accumulation of lipofuscin in the brain stem did not appear to be altered as a consequence of CPZ treatment. Data indicate that long-term treatment with CPZ may result in some behavioral decrements in aging mice which may be associated with changes in endogenous level of brain catecholamine. (Author abstract modified)

247729 Cox, Raymond H., Jr.; Maickel, Roger P. Mead Johnson Research Laboratories, Evansville, IN 47721 Differential effects of alpha MT on anorectic and stimulatory action of amphetamines. *Research Communications in Chemical Pathology and Pharmacology*. 12(4):621-626, 1975.

An investigation of the differential effects of alpha MT on anorectic and stimulatory action of amphetamines is reported. It was found that pretreatment of rats with a dosage regimen of alpha MT that has no effect on the anorectic action of a single dose of 2mg/kg of d-amphetamine or methamphetamine causes a marked reduction in the rate of continuous avoidance responding evoked by that same dose. Similar pretreatment followed by a dose of 8.0mg/kg of benzphetamine was without effect on the drug's action on both systems. It is concluded that a pretreatment regimen of alpha MT that lowers brain norepinephrine by approximately 55% has clearly separable effects on the anorectic and stimulatory actions of several amphetamines. 13 references. (Author abstract modified)

247778 Sansone, M. Laboratorio di Psicobiologia e Psicofarmacologia, C.N.R., 1, Via Reno - 00198 Rome, Italy

Benzodiazepines and amphetamine on avoidance behaviour in mice. Archives Internationales de Pharmacodynamie et de Therapie (Ghent). 218(1):125-132, 1975.

Six benzodiazepine derivatives, given alone or in combination with amphetamine, were tested in mice subjected to five 100 trial avoidance sessions in the shuttlebox. All derivatives, except bromazepam, showed some facilitating effects on avoidance responding when given alone. Facilitation was particularly evident following the administration of chlordiazepoxide (2.5mg/kg), medazepam (10mg/kg) and nitrazepam (0.25, 0.5 and 1mg/kg). Favorable effects were obtained by combining each benzodiazepine compound with amphetamine. The levels of avoidance responses were usually higher under benzodiazepine/amphetamine combinations than under benzodiazepines alone. 23 references. (Author abstract)

248163 Hauser, Donald C. R.; Levandowsky, M.; Glassgold, Judith M. Haskins Laboratories at Pace University, 41 Park Row, New York, NY 10038 **Ultrasensitive chemosensory responses by a protozoan to epinephrine and other neurochemicals.** Science. 190(4211):285-286, 1975.

A behavioral assay was developed based on differential tendency of a protozoan to attach to an agar gel containing the test substance. The heterotrophic marine dinoflagellate *Cryptocodinium (Gyrodinium) cohnii* responded negatively (less tendency to attach) to epinephrine at concentrations above 5×10^{-15} M and to norepinephrine at concentrations above 5×10^{-9} M. Response to choline as choline H₂ citrate, choline bitartrate, and choline chloride was negative above 10^{-7} M but response to the choline analog carbachol was positive (greater tendency to attach) in the range 5×10^{-6} to 5×10^{-4} M. Other responses to neurochemicals at comparable concentrations were: dopa, betaine, and glycine positive; L-glutamic acid, tryptophan, putrescine, and taurine negative. Serotonin was inert, responses to tyrosine and gamma-aminobutyric acid were variable, and phenylalanine (6×10^{-4} M) and 5-hydroxytryptophan (5×10^{-4} M) were negative only at the highest concentrations tested. 17 references. (Author abstract)

248283 Sofia, R. Duane; Solomon, Thomas A.; Barry, Herbert III. Department of Pharmacology and Toxicology, Wallace Laboratories, Half Acre Road, Cranbury, NJ **Anticonvulsant activity of delta9-tetrahydrocannabinol compared with three other drugs.** European Journal of Pharmacology (Amsterdam). 35(1):7-16, 1976.

Delta9-tetrahydrocannabinol (THC) is compared with diphenylhydantoin (DPH), phenobarbital (PB) and chlordiazepoxide (CDP) using several standard laboratory procedures to determine anticonvulsant activity in mice, i.e., the maximal electroshock test (MES), and seizures induced by pentylenetetrazol, strychnine and nicotine. In the MES test, THC was found to be the most potent and DPH the most potent blocker of hind limb tonic extensor convulsions whereas THC was the most potent and DPH the least potent in increasing the latency to this response and in preventing mortality. Seizures and mortality induced by pentylenetetrazol or by strychnine were observed to be enhanced by THC and DPH and were blocked by PB and CDP. In the test with nicotine, none of the four anticonvulsant agents prevented seizures; DPH was the only one which failed to increase latency; THC and DPH were found less potent than PB and CDP in preventing mortality. THC most closely resembled DPH in the tests with chemical convulsant agents, but a sedative action of THC, resembling that of PB and CDP, was indicated by low ED₅₀ for increased latency and for prevention of mor-

tality in the MES test. It is concluded that there may be clinical usefulness for a compound such as THC which combines some degree of the anticonvulsant specificity of DPH with the general sedative effect of PB and CDP. 42 references. (Author abstract modified)

248285 Pijnenburg, A. J. J.; Honig, W. M. M.; Van Der Heyden, J. A. M.; Van Rossum, J. M. Department of Pharmacology, University of Nijmegen, Geert Grooteplein Noord 21, Nijmegen, The Netherlands **Effects of chemical stimulation of the mesolimbic dopamine system upon locomotor activity.** European Journal of Pharmacology (Amsterdam). 35(1):45-58, 1976.

The effects of local injections of drugs into terminal areas of the mesolimbic dopamine system are investigated. Bilateral administration of dopamine, but not of noradrenaline and serotonin, into the nucleus accumbens of nonpretreated rats resulted in stimulation of locomotor activity. No clear effects, or only minor effects, were seen after injections of the dopamine metabolites 3-methoxytyramine, DOPAC and HVA and after injections of media with different pH and osmolality. d-Amphetamine proved more effective than dopamine in producing locomotor stimulation, whereas both stimulant and depressant effects were observed following injection of apomorphine into the nucleus accumbens. ET 495 and the noradrenaline agonists clonidine, phenylephrine and isoprenaline did not enhance locomotor activity, but theophylline was found effective. Pretreatment with haloperidol, but not with clozapine, significantly reduced the effects of dopamine and theophylline. Locomotor stimulation was also found following bilateral administration of dopamine, d-amphetamine and apomorphine into the tuberculum olfactorium, whereas noradrenaline, serotonin and ET 495 produced no effect, or rather depressant effects. These results provide further evidence for an important role of the mesolimbic dopamine system with respect to locomotor activity. 41 references. (Author abstract)

248287 Kelly, Peter H.; Miller, Richard J.; Neumeyer, John L. Department of Experimental Psychology, Downing Street, Cambridge CB2 3EB, England **Apomorphines 16: action of apomorphine alkaloids on locomotor activity in rats with 6-hydroxydopamine lesions of the nucleus accumbens.** European Journal of Pharmacology (Amsterdam). 35(1):85-92, 1976.

(-)-Apomorphine and (+ or -) N-n-propylnorapomorphine (+ or -)NPA produce stereotypy but not locomotor activity in normal rats. In rats with selective bilateral lesions of dopamine terminals in the nucleus accumbens induced by microinjection of 6-hydroxydopamine both compounds produced a marked stimulation of locomotor activity. (+ or -)NPA was considerably more potent than (-)-apomorphine. The maximal intensity of stimulation produced by the two drugs was, however, similar. The locomotor stimulant effects of (-)-apomorphine were inhibited by (+)-bulbocapnine (20 mg/kg) or pimozide (0.5mg/kg). (+ or -)N-n-Propylnorapocodine also produced a long-lasting stimulation of locomotor activity. (+ or -)Apomorphine, (+ or -)isoapomorphine, (-)-1,2-dihydroxyapomorphine, and (-)-nuciferine were all found to be inactive in stimulating locomotor activity. 19 references. (Author abstract)

248406 Weissman, Albert. Pfizer, Inc., Groton, CT 06340 **Penfluridol blockade of apomorphine: dependence of duration on species and endpoint.** European Journal of Pharmacology (Amsterdam). 33(2):267-275, 1975.

A study undertaken to confirm the unprecedented duration of apomorphine antagonism reported for low dose penfluridol

in dogs and to examine whether penfluridol exerts a similar effect in blocking prototypical symptomatic effects of apomorphine in other species is reported. In mice tested for apomorphine elicited hypothermia, and in rats tested for apomorphine elicited chewing behavior, the antiapomorphine activity of penfluridol did not persist for longer than 2 to 3 days even when high doses of penfluridol were given. In rabbits tested for apomorphine induced hyperthermia and gnawing penfluridol block apomorphine for about a week. Thus, of the three species tested, only in rabbits does the duration of penfluridol's antiapomorphine action approximate the 1 week duration reported from human therapeutic trials. In mice given high dose penfluridol, apomorphine consistently elevated body temperatures, rather than exerting its usual hypothermic response. Conversely, in rabbits given penfluridol, apomorphine tended slightly to decrease body temperatures, rather than exerting its usual hyperthermic response. 16 references. (Author abstract modified)

248538 Bossie, Paul C.; Ferguson, C. Parker; Sultan, Walter E.; Lennox, Willard J.; Dudley, Gaston E.; Rea, Thomas H.; Miller, Jacob I. Chemical Research Division, Chemical Laboratory, Edgewood Arsenal, Aberdeen Proving Ground, MD 21010 Synthesis and biological activity of new 2-substituted analogs of fluphenazine. *Journal of Medicinal Chemistry*. 19(3):370-373, 1976.

A series of 2 - substituted analogs of fluphenazine, namely the nitro, cyano, dicyanethenyl, and nitroethenyl compounds, were synthesized and tested in mice as potential neuroleptics using catalepsy as the end point. The more promising compounds were further studied using the more sensitive rat catalepsy test, results of which reportedly correlate well with neuroleptic potency in man. The nitrosubstituted compound, (dimalate form) possessing the most strongly electron attracting 2 - substituent, was found to be the most potent of the series. 17 references. (Author abstract modified)

248539 Aeberli, Paul; Gogerty, John H.; Houlihan, William J.; Iorio, Louis C. Research and Development Department, Sandoz Pharmaceuticals, Hanover, NJ 07936 Synthesis and central nervous system depressant activity of some bicyclic amides. *Journal of Medicinal Chemistry*. 19(3):436-438, 1976.

A series of aryl bicyclic analogs of succinimide and glutarimide was prepared and evaluated in mice for CNS depressant activity. The 8a-aryl-3,4,6,7,8,8a-hexahydro-2H-pyrrolo (2,1-b)(1,3)oxazin-6-ones are found to possess the best overall spectrum of activity relative to the standard agents glutethimide and phenobarbital. 12 references. (Author abstract)

248605 Fuller, Ray W.; Rathbun, Robert C.; Parli, C. John. Lilly Research Laboratories, Eli Lilly and Company, Indianapolis, IN 46206 Inhibition of drug metabolism by fluoxetine. *Research Communications in Chemical Pathology and Pharmacology*. 13(2):353-356, 1976.

A study was conducted in mice and rats to determine the inhibition of drug metabolism by fluoxetine. Results show that fluoxetine hydrochloride (Lilly 11014: 3-p-trifluoromethylphenoxy-3-phenyl-N-methyl-propylamine hydrochloride) inhibited the metabolism of hexobarbital and ethinamate in rodents and prolonged the hypnotic effects of these drugs. It is concluded that the possibility of such metabolic interactions should be considered as an explanation of any pharmacologic interactions observed between fluoxetine and other drugs. 4 references. (Author abstract modified)

248646 Pars, Harry G.; Granchelli, Felix E.; Razdan, Raj K.; Keller, Jacqueline K.; Teiger, David G.; Rosenberg, Franklin J.; Harris, Louis S. SISA Incorporated, Cambridge, MA 02138 Drugs derived from cannabinoids. 1. Nitrogen analogs, benzopyranopyridines and benzopyranopyrroles. *Journal of Medicinal Chemistry*. 19(4):445-454, 1976.

The synthesis and comparative activity in mice of a variety of nitrogen analogs of drugs derived from cannabinoids are reported. Minimum effective doses and lethal doses were determined by a modified Irwin mouse screen after iv administration of compounds in PEG 200. The most potent compounds were found to be the propargyl, allyl, and chlorallyl derivatives of N-substituted Benzopyrano(3,4-d) pyridines. Overt behavioral effects (CNS depression, static ataxia, and hypersensitivity) of propargyl and Roger Adams' carbocyclic analog dimethylheptylpyran were found to be similar in the mouse, cat, dog, and monkey. Dichloroisoproterenol prevented and reversed many of the depressant effects of both dimethylheptylpyran and the propargyl but had no effect on the ataxia produced by these compounds. In antinociceptive tests, propargyl was active in the phenylquinone and Eddy hot plate tests but was inactive in the tail flick test. 28 references. (Author abstract modified)

248647 Razdan, Raj K.; Terris, Barbara Zitko; Pars, Harry G.; Plotnikoff, Nicholas P.; Dodge, Patrick W.; Dren, Anthony T.; Kyncl, Jaroslav; Somani, Peter. SISA Incorporated, Cambridge, MA 02138 Drugs derived from cannabinoids. 2. Basic esters of nitrogen and carbocyclic analogs. *Journal of Medicinal Chemistry*. 19(4):454-461, 1976.

The syntheses and activity in selected pharmacological tests of various basic esters of nitrogen and carbocyclic analogs of cannabinoids are reported. It is shown that making the basic ester from the phenol retains biological activity and can lead to a greater selectivity of action, particularly the antinociceptive activity. The most interesting esters in the nitrogen analogs series and the carbocyclic series are identified and discussed. It is noted that one of the esters in the nitrogen analog series was more potent than codeine in the writhing, hot plate, and tail flick tests. One of the esters in the carbocyclic series was found to be very potent in the mouse audiogenic seizure test and is judged to be of interest as an anticonvulsant agent. 25 references. (Author abstract modified)

248648 Winn, Martin; Arendsen, David; Dodge, Patrick; Dren, Anthony; Dunnigan, Daniel; Hallas, Robert; Hwang, Kao; Kyncl, Jaroslav; Lee, Yien-Hwei. Division of Medicinal Chemistry and Pharmacology, Abbott Laboratories, North Chicago, IL 60064 Drugs derived from cannabinoids. 5. Delta-tetrahydrocannabinol and heterocyclic analogs containing aromatic side chains. *Journal of Medicinal Chemistry*. 19(4):461-471, 1976.

The synthesis and pharmacological activity of various delta6a,10a-tetrahydrocannabinols and their nitrogen, sulfur, and carbocyclic analogs with an arylalkyl side-chain are reported. They showed pharmacological activity as analgesics, tranquilizers, antihypertensives, and hypnotics; and as antisecretory, antiulcer, and antidiarrheal agents. The most potent compounds had either a 1-methyl-4-(4-fluorophenyl)butyl or a 1,2-dimethyl-4-(4-fluorophenyl)butyl side-chain. 38 references. (Author abstract modified)

248649 Nagarajan, Kuppaswamy; David, Joy; Shah, Rashmi K. Ciba-Geigy Research Centre, Bombay 63, India Central nervous system active 5-oxo-1,4,5,6,7,8-hexahydrocinnolines. *Journal of Medicinal Chemistry*. 19(4):508-511, 1976.

The results of a study of the CNS profile of a series of novel 5-oxo-1,4,5,6,7,8-hexahydrocinnolines are reported. 1-(2-diethylaminoethyl)-3-(p-fluorophenyl)-5-oxo-7,7-dimethyl-1,4,5,6,8-hexahydrocinnoline and 1-(2-dimethylaminoethyl)-3-phenyl-5-oxo-7,7-dimethyl-1,4,5,6,7,8-hexahydrocinnoline were found to have sedative and anticonvulsant properties and to be active in tests used to characterize antidepressants. It is noted that their narrow safety margin precluded further followup studies. Derivatives of 2-(omega-phenacyl)-3-hydrazino-5,5-dimethyl-2-cyclohexenone were active in tests used to characterize antidepressants and were weakly sedative but not anticonvulsant. 11 references. (Author abstract modified)

248650 McDermed, John D.; McKenzie, Gerald M.; Freeman, Harold S. Department of Chemistry, Wellcome Research Laboratories, Research Triangle Park, NC 27709 **Synthesis and dopaminergic activity of (+ or -), (+)-, and (-)-2-dipropylamino-5-hydroxy-1,2,3,4-tetrahydronaphthalene.** Journal of Medicinal Chemistry. 19(4):547-549, 1976.

In an effort to identify further the structural requirements for central dopamine receptor agonists, some monohydroxyl analogs of the known agonist 5,6-dihydroxy-2-dipropylamino-1,2,3,4-tetrahydronaphthalene were synthesized. They were examined for production of emesis in dogs and stereotyped behavior in rats. The most potent was 5-hydroxy-2-dipropylamino-1,2,3,4-tetrahydronaphthalene, which was more potent than apomorphine but less so than the dihydroxyl analog. The two enantiomers of the monohydroxyl analog were synthesized by conventional methods from an optically active intermediate, 2-benzylamino-5-methoxy-1,2,3,4-tetrahydronaphthalene. The resolution of this amine was performed with the aid of mandelic acid. Dopaminergic activity was found to be confined to the levo enantiomer. Requirements for both substitution and chirality in the tetralins were found to correspond closely to those known for the dopaminergic aporphines. 7 references. (Author abstract)

248651 Razdan, R. K.; Terris, B. Zitko; Handrick, G. R.; Dalzell, H. C.; Pars, H. G.; Howes, J. F.; Plotnikoff, N.; Dodge, P.; Dren, A.; Kyncl, J.; Shoer, L. SISA Incorporated, Cambridge, MA 02138 **Drugs derived from cannabinoids. 3. Sulfur analogs, thiopyranobenzopyrans and thienobenzopyrans.** Journal of Medicinal Chemistry. 19(4):549-551, 1976.

The synthesis of sulfur analogs of drugs derived from cannabinoids and their biological activity in selected pharmacological tests are reported. Sulfur analogs of cannabinoids corresponding to dimethylheptylpyran were prepared utilizing the Pechmann condensation between the appropriate keto ester and 5-(1,2-dimethylheptyl)resorcinol, followed by Grignard reaction. Compounds of various structural types which had different ring size and position of the sulfur atom substituted in the alicyclic ring, were found to be active CNS agents in pharmacological tests in mice, rats, and dogs. They showed profiles qualitatively similar to those of the nitrogen and carbocyclic analogs. Basic esters of the most interesting parent phenols were also prepared and tested. 10 references. (Author abstract modified)

248652 Razdan, Raj K.; Handrick, G. R.; Dalzell, H. C.; Howes, J. F.; Winn, M.; Plotnikoff, N. P.; Dodge, P. W.; Dren, A. T. SISA Incorporated, Cambridge, MA 02138 **Drugs derived from cannabinoids. 4. Effect of alkyl substitution in sulfur and carbocyclic analogs.** Journal of Medicinal Chemistry. 19(4):552-554, 1976.

The effect of alkyl substitution in sulfur and carbocyclic analogs of drugs derived from cannabinoids is reported. Vari-

ous CNS active cannabinoids in which the alicyclic ring was thiopheno, cyclopenteno, or cyclohexeno with the alkyl substituent in various positions were synthesized by procedures described previously. These compounds were compared in selected pharmacological tests in mice, rats, dogs, and cats. Results suggest that methyl substitution in the close proximity of the phenolic hydroxyl group strongly influences the activity of some cannabinoids, particularly of those which had a planar five membered alicyclic ring rather than a six membered ring. 15 references. (Author abstract modified)

248960 Molander, Lars; Randrup, Axel. Pharmacological Department, AB Ferrosan, Fack, S-201 10 Malmö 1, Sweden **Effects of thymoleptics on behaviour associated with changes in brain dopamine: I. potentiation of dopa-induced gnawing of mice.** Psychopharmacologia (Berlin). 45(3):261-265, 1976.

The results of the first experiment in a series of two which studied the effects of thymoleptics on behavior associated with changes in brain dopamine are reported. It was found that the thymoleptics imipramine, desipramine, protriptyline, nortriptyline, chlorimipramine and amitriptyline all potentiate gnawing of mice induced by dopamine following the decarboxylase inhibitor Ro 4-4602. It is hypothesized that the gnawing behavior is probably associated with the increase in brain dopamine resulting from this treatment. Thymoleptics also affect other types of behavior associated with brain dopamine. The relevance of these effects to clinical antidepressant effect and their possible utilization for preclinical screening tests are discussed. 40 references. (Author abstract modified)

249271 Jacobson, Joseph; Markowitz, Robert; Bain, George; Kornetsky, Conan. Boston University School of Medicine, Boston, MA 02118 **Naloxone blockade of morphine analgesia -- a dose effect study of duration and magnitude.** Pharmacologist. 17(2):206, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics held in August 1975 at the University of California, Davis, a study to determine the minimal dose of naloxone (NAX) needed to block the analgesic effect of 10mg/kg of morphine sulfate (MS) as measured by the footshock titration procedure was presented. Nine groups of Holzman rats, 4 to 5 animals in each, were studied. Eight of the 9 groups received a fixed dose of 10mg/kg s.c. of MS preceded 15 min by either 2.0, 1.0, 0.5, 0.25, 0.125, 0.06, 0.03 or 0.0mg/kg of NAX s.c. One group received saline in lieu of MS. After the MS, animals were tested on the footshock titration procedure for 150 min. The results indicate that 1.0mg/kg is the minimum dose needed to produce full blockade of the MS effect. Dose of NAX was linearly related to degree of blockade. A dose of 0.06mg/kg of NAX significantly delayed the onset of the MS effect. The dose of NAX which caused a 50% decrease in the area under the time effect curve was approximately 0.05mg/kg. These results clearly demonstrate that very small doses of NAX will significantly attenuate and delay the onset of the effect of 10mg/kg of MS and in this procedure a dose ratio of 1:10 (NAX:MS) provides complete blockade of the MS effect. (Author abstract modified)

249276 Stark, Paul; Archer, Robert A. The Lilly Research Laboratories, Indianapolis, IN 46206 **Preclinical pharmacologic profile of a psychoactive cannabinoid.** Pharmacologist. 17(2):210, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study presenting a

preclinical pharmacologic profile of a psychoactive cannabinoid was reported. Lilly compound 109514, dl-3-(1,1-dimethylheptyl)-6,6-gabeta, 7,8,10aalpha-hexahydro-1-hydroxy-6,6-dimethyl-9H-dibenz(b,d)pyran-9-one a cannabinoid, has been synthesized and found to be active in altering behavior when administered either orally or parenterally. The latency, duration and degree of effect are predictable and dose related. Standard behavioral assays, such as inhibition of muricide by rats, inhibition of septal lesioned rat reactivity, dog observation and mouse activity were used for evaluation of the psychoactive effects. The minimal effective dose in rodents was approximately 1.25mg/kg p.o. The effects of various doses of Compound 109514 on blood pressure and heart rate in unanesthetized rabbits and dogs were measured. Changes in blood pressure occurred only after incapacitating doses were administered. The minimal effective dose in the dog observation studies was less than .016mg/kg i.v. EKG studies in dogs were done and doses as high as 1mg/kg i.v. did not cause any significant alteration of the EKG. The pattern of behavioral effects seen was consistent with those of clinically useful anxiolytic drugs. (Author abstract modified)

249281 King, Carl D. University of Tennessee Center for the Health Sciences, Memphis, TN 38163 **Inhibition of slow wave sleep and rapid eye movement sleep by thyrotropin releasing hormone in cats.** Pharmacologist. 17(2):211, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis a study examining the inhibition of slow wave sleep and rapid eye movement (REM) sleep by thyrotropin releasing hormone (TRH) in cats was presented. Cats were implanted with electrodes for the measurement of sleep/wakefulness patterns, and with cannulae for injections into the lateral ventricle of the brain. Polygraph recordings were scored for wakefulness, spindle sleep, slow wave sleep and REM sleep. Thyrotropin releasing hormone (TRH, 200micrograms) or saline was administered via the cannulae. Saline injections caused no changes over control. TRH induced several changes: sleep latency was increased; total time awake was increased; slow wave sleep was inhibited; REM sleep was also inhibited. After TRH, almost all of the sleep which occurred was spindle sleep. This alerting effect may partially be mediated by the release of thyroid hormones, but such is not likely to be the entire case. TRH, 1mg/kg, administered parenterally (intravenously, intraperitoneally and intramuscularly) caused no alterations in sleep/wakefulness behavior. It is concluded that TRH has a direct effect upon the CNS of cats, at least partially exclusive of its effects upon the endocrine system. (Author abstract modified)

249296 Preache, Maurline M.; Gibson, James E. Department of Pharmacology, Michigan State University, East Lansing, MI 48824 **Development and adult behavioral abnormalities in mice treated neonatally with cyclophosphamide.** Pharmacologist. 17(2):248, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining development and adult behavioral abnormalities in mice treated neonatally with cyclophosphamide. Cyclophosphamide (Cp), an antineoplastic agent, was administered s.c. to Swiss Webster mice on the day of birth, and the mice were tested for developmental or adult behavioral abnormalities. Cp dosages of 20, 30 or 45mg/kg retarded maturation of swimming ability and 45mg/kg retarded maturation of the righting reflex. At 7 weeks of age mice treated neonatally

with 30 or 45mg/kg Cp had reduced locomotor activity and were more emotionally reactive than controls in an open field. Mice treated with 30mg/kg Cp, but not those treated with 20mg/kg Cp, tended to avoid shock less often than controls, and those treated with 20mg/kg fell more frequently when crossing a rotating rod for food. All dosages examined decreased body weight gains but only 30 or 45mg/kg resulted in gross body malformations. Results indicate that Cp can functionally impair the development of mice, and that some of these impairments are independent of gross body malformations. (Author abstract modified)

249623 Babbini, M.; Gairadi, M.; Bartoletti, M. Institute of Pharmacology, University of Bologna, Bologna Italy **Relationship between the behavioral and electroencephalographic effects of chlorpromazine and fluphenazine in rats.** Pharmacology (Basel). 13(6):520-525, 1975.

A study is presented in which the effects of chlorpromazine and fluphenazine on behavior and electroencephalogram (EEG) are examined in rats in order to determine whether quantitative surface EEG can be reliably used to assess the degree of hypnotic sedative activity of neuroleptic agents. It was found that fluphenazine is about 10 times more potent than chlorpromazine in depressing locomotor activity and variable interval behavior rats, while the two drugs were equally potent as in terms of their synchronizing action on the EEG. These findings are in accordance with the clinical observation that fluphenazine has less hypnotic side effects than chlorpromazine and confirms that surface EEG can be a predictive test for hypnotic activity. 15 references. (Author abstract)

250068 Bernard, Bruce K. Section of Pharmacology and Toxicology, University of Connecticut, Storrs, CT 06268 **Testosterone manipulations: effects on ranacide aggression and brain monoamines in the adult female rat.** Pharmacology, Biochemistry and Behavior. 4(1):59-65, 1976.

The effects of testosterone propionate on ranacide (frog killing) behavior and brain norepinephrine (NE), dopamine (DA) and serotonin (5-HT) levels were determined in 40 female Wistar rats. Adult rats were screened for frog killing behavior on the basis of a single 30 min testing session. Aggressors were defined as animals who attacked or killed during this session while nonaggressors failed to do so. Using either aggressors or nonaggressors, testosterone and sesame oil equally increased aggressive behavior as measured in a second 30 min testing session. Biochemical analyses indicated that testosterone treated animals had significantly higher brain NE and NE/5-HT levels. Aggressors, testosterone or sesame treated, had higher NE/5-HT ratios. Brain levels of DA and 5-HT and the DA/5-HT ratios were unaffected. It is concluded that the elicitation of ranacide in the adult female rat is not androgen dependent nor is this behavior functionally related to the observed differences in brain noradrenergic/serotonergic levels. It is felt that this study provides additional evidence that ranacide is a type of predatory aggression and yet presents data which may be at variance with the classic monoaminergic theory of aggressive behaviors. 38 references. (Author abstract)

250087 Wei, Eddie; Loh, Horace; Way, E. Leong. School of Public Health, University of California, Berkeley, CA 94720 **Potency of the N31m-methyl analog of TRH in the induction of shaking movements in the rat.** European Journal of Pharmacology (Amsterdam). 36(1):227-229, 1976.

The relative potencies of thyrotropin releasing hormone (TRH) analogs in provoking a shaking response in rats are re-

ported. Bilateral administration of 0.011 to 2.0 micrograms TRH analog into the periaqueductal fourth ventricular spaces of the barbiturate anesthetized rat showed that N3im-methyl TRH was approximately 10 times more potent than TRH, whereas N1im-methyl TRH was approximately 10 times less potent than TRH. These results indicate that the potencies of the TRH analogs in inducing shaking parallel their thyrotropin releasing activities. 10 references. (Author abstract modified)

250360 Sayers, A. C.; Burki, H. R. Research Institute Wander, Wander Ltd., P. O. Box 2747, CH-3001 Berne, Switzerland. **Antiacetylcholine activities of psychoactive drugs: a comparison of the (3H)quinuclidinyl benzilate binding assay with conventional methods.** *Journal of Pharmacy and Pharmacology* (London). 28(3):252-253, 1976.

Antiacetylcholine potency of various drugs as determined by the 3H-QNB binding assay is compared with data obtained from more conventional tests, such as those based on guinea pig isolated ileum, on oxotremorine antagonism and on the effects on pupillary aperture. The regulation of the pupillary aperture was effected peripherally by both cholinergic and adrenergic mechanisms and no correlation was found with the antiacetylcholine effects obtained with the other test system. It is concluded that the 3H-QNB binding assay and the guinea pig ileum are equally useful for measuring antiacetylcholine activity in vitro. Neither test permits reliable conclusions to be drawn concerning acetylcholine effects in the brain. 2 references.

250939 Taylor, M.; Goudie, A. J. Department of Psychology, University College of North Wales, Bangor, Wales. **Comparisons between the behavioural and anorexic effects of 780SE and other phenylethylamines in the rat.** *Postgraduate Medical Journal* (Oxford). 51(1):56-65, 1975.

In a paper presented at a symposium organized by the Servier Research Institute held in Marbella, Spain March 1974, the behavioral and anorexic effects of fenfluramine, norfenfluramine, and 780SE in the rat were discussed. Behavioral activity analysis of these compounds indicates that acutely after intraperitoneal administration they all possess sedative properties but that 780SE and the related compound 1513 are much less active when administered subcutaneously. Chronically, fenfluramine and norfenfluramine possess possible stimulant properties, the latter being more potent, while 780SE has been found to be totally devoid of stimulant properties. Anorexic effects of these compounds were assessed by body weight recording in chronic studies. All compounds were found to have a pronounced permanent dose related effect on body weight. The effects of 780SE on rat body weight built up slowly in comparison to equivalent studies of fenfluramine and norfenfluramine. All three compounds have been found to induce abnormal behavior at high doses, the characteristic behavioral pattern elicited being that of backward walking. The results show that 780SE possesses a number of properties which make it a potentially attractive anorexic agent. It appears to be devoid of any possible stimulant properties. It is also active anorexically over long periods of time and much larger doses of 780SE are required to elicit abnormal behavior than fenfluramine and norfenfluramine. 44 references.

251130 Marvola, Martti. Department of Pharmacology, School of Pharmacy, University of Helsinki, Kirkkokatu 20, SF-00170 Helsinki 17, Finland. **Effect of acetylated derivatives of some sympathomimetic amines on the acute toxicity, locomotor activity and barbiturate anaesthesia time in mice.** *Acta Pharmacologica et Toxicologica* (Copenhagen). 38(5):474-489, 1976.

An experiment conducted to study how acetylation affects the activity of sympathomimetic amines is reported. Effects of tyramine, amphetamine, ephedrine, phenyl, orciprenaline, and their O-acetyl and N-acetyl derivatives on acute toxicity locomotor activity and barbiturate anesthesia time were studied. N-acetylated derivatives were found always to be significantly less toxic, whereas O-acetylated derivatives were found always to be more toxic, than the parent compounds, when tested in mice. Amphetamine ephedrine, and tyramine increased locomotor activity in the mice. O-acetylephephedrine had a similar but weaker observed effect in this respect than ephedrine O-acetyltyramine and N-acetylated derivatives of tyramine, amphetamine, and ephedrine reduced the locomotor activity of mice. Phenylephrine and its O-acetyl and N-acetyl derivatives reduced the locomotor activity of mice to about the same degree. Amphetamine, ephedrine, O-acetylephephedrine and tyramine reduced the duration of barbiturate anesthesia, whereas this was prolonged by adrenaline, N-acetyltyramine, N-acetylamphetamine, and N-acetylephephedrine. Results show that N-acetylation decreased or even reversed the action of the parent compound. O-acetylation increased toxicity but reduced the other effects of the drugs studied. It is thought probable that the effects of O-acetyl derivatives are at least partly due to deacetylation. 36 references. (Author abstract modified)

251226 Anden, Nils-Erik; Grabowska, Maria; Strombom, Ulf. Department of Pharmacology, University of Goteborg, Fack, S-400 33 Goteborg 33, Sweden. **Different alpha-adrenoreceptors in the central nervous system mediating biochemical and functional effects of clonidine and receptor blocking agents.** *Naunyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 292(1):43-52, 1976.

The influence of clonidine on alpha-adrenoreceptors in the central nervous system of rats and mice was investigated. Both functional events due to postsynaptic receptor stimulation (flexor reflex activity, motor activity) and biochemical changes have been considered. Results show that clonidine was less potent in stimulating the hindlimb flexor reflex activity of spinal rats than in inhibiting the alpha-methyltyrosine induced disappearance of noradrenaline in the spinal cord and in the whole brain of rats. The increase in flexor reflex activity due to clonidine (0.4mg/kg) was virtually completely inhibited by phenoxybenzamine (20mg/kg) and haloperidol (10mg/kg), was partially inhibited by yohimbine (10mg/kg) and piperoxan (60mg/kg) and was not significantly inhibited by yohimbine (3mg/kg) and tolazoline (50mg/kg). The potentiation by clonidine of the apomorphine induced locomotor stimulation of reserpine treated mice was almost completely inhibited by phenoxybenzamine (20mg/kg). Clonidine (0.1mg/kg) caused an inhibition of the accumulation of Dopa after decarboxylase inhibition in the noradrenaline rich regions of the rat central nervous system. The postsynaptic functional effects and the biochemical effects of clonidine may be due to stimulation of different alpha-adrenoreceptors since the two effects were inhibited differently by various alpha-adrenoreceptor blocking agents and since the two effects were produced by different doses of clonidine. The alpha-adrenoreceptors mediating the biochemical changes might be located on the noradrenergic neurones. 51 references. (Author abstract modified)

251227 Grabowska, Maria; Anden, Nils-Erik. Institute of Pharmacology, Polish Academy of Sciences, PL-31-344 Krakow, Poland. **Noradrenaline synthesis and utilization: control by nerve impulse flow under normal conditions and after treatment with alpha-adrenoreceptor blocking agents.** *Naunyn-*

Schmiedeberg's Archives of Pharmacology (Berlin). 292(1):53-58, 1976.

The changes in the synthesis and utilization of noradrenaline cranial and caudal to an acute section of the rat spinal cord have been used to investigate the importance of nerve impulses for these processes. Cranial to a lesion of the spinal cord, the alpha-methyltyrosine induced disappearance of noradrenaline was accelerated by the alpha-adrenoreceptor blocking agents yohimbine (10mg/kg), piperoxan (60mg/kg) and tolazoline (50mg/kg). In the absence of nerve impulses caudal to a lesion of the spinal cord, this disappearance was decelerated as compared to that cranial to the lesion and it was not influenced by the three alpha-adrenoreceptor blocking agents. The accumulation of dopa after decarboxylase inhibition cranial to a lesion of the spinal cord was accelerated by yohimbine, piperoxan and tolazoline, but not significantly affected by phenoxybenzamine and haloperidol (10mg/kg). In the absence of nerve impulses caudal to a lesion of the spinal cord, the Dopa accumulation was decelerated as compared to that cranial to the lesion and it was not influenced by the former three alpha-adrenoreceptor blocking agents as well as by clonidine. The results show that the synthesis and the utilization of noradrenaline normally, as well as the accelerations of these processes by alpha-adrenoreceptor blocking agents, are dependent on nerve impulses. The stimulation of the synthesis and utilization of noradrenaline by nerve impulses might be influenced via the activity of the alpha-adrenoreceptors located either on the nerve terminals or on the cell bodies or on both parts of the noradrenergic neurones. In the absence of nerve impulses, a receptor mediated feedback mechanism similar to that described for the synthesis of dopamine does not appear to regulate the synthesis of noradrenaline. 29 references. (Author abstract modified)

252445 Petocz, L.; Kosoczy, I. Pharmacological Laboratory, EGYT Pharmacochemical Works, Budapest, Hungary The main pharmacological characteristics of Grandaxin (tolizopam, EGYT-341). *Therapia Hungarica* (Budapest). 23(4):134-138, 1975.

Results of experiments using rats, cats and dogs are used to illustrate some characteristics of the Hungarian anxiolytic drug, Grandaxin. Results showed no secondary symptoms of either toxicity or drowsiness, but high doses produced catalepsy in rodents. Grandaxin was not found to have an anticonvulsant effect. Since it manifested a coronary dilator effect, its potential use as antianginous adjuvant is to be considered in addition to its use as a tranquilizer. 14 references.

03 MECHANISM OF ACTION: PHYSIOLOGICAL, BIOCHEMICAL AND PHARMACOLOGICAL

243041 Guidotti, A.; Naik, S. R.; Kurosawa, A.; Costa, E. Lab. of Preclinical Pharmacology, NIMH, Saint Elizabeths Hosp., Washington, DC 20032 Central gamma aminobutyric acid receptors and the regulation of 3',5'-cyclic adenosine monophosphate content in rat pituitary. (Unpublished paper) Washington, DC, NIMH, 1976. 17 p.

Pilot studies of the interactions between pharmacological modifications of the function of gamma-aminobutyric acid (GABA) receptors and changes in rat pituitary 3',5'-cyclic adenosine monophosphate (cAMP) content are reported. The changes in pituitary cAMP content caused by GABA receptor modification was contrasted with those elicited by a blockade of monoamine receptor mechanisms in order to assess whether GABA receptors are independent from monoamine receptors in regulating pituitary cAMP content. The results justify the

assumption that GABA receptor activation inhibits the increase in pituitary cAMP content elicited by GABA synthesis blockade but fails to reduce the cAMP increase elicited by reserpine. The activation of the protein kinase activity index elicited in the pituitary by reserpine and GABA receptor blockade, suggests a possible relationship between protein kinase activation and the increase in pituitary secretion. 20 references. (Author abstract modified)

243182 Mitra, Gopa; Poddar, M. K.; Ghosh, J. J. Dept. of Biochemistry, Calcutta University, Calcutta 700019, India In vivo and in vitro effects of delta9-tetrahydrocannabinol on rat liver microsomal drug-metabolizing enzymes. *Toxicology and Applied Pharmacology*. 35(3):523-530, 1976.

The in vivo and in vitro effects of delta9-tetrahydrocannabinol (delta9-THC) on rat liver microsomal dimethylaniline-N-demethylase, p-nitroanisole-O-demethylase and aniline hydroxylase, activities were studied. In vivo acute administration of delta9-THC produced a marked inhibitory effect of these drug metabolizing enzyme activities at the higher dose (50mg/kg) after 6 hours of i.p. injection. The inhibition was of mixed type for the two demethylases and noncompetitive in the case of aniline hydroxylase, whereas comparatively fewer inhibitory effects on these enzyme activities were observed at the lower dose (10mg/kg). Chronic treatment with delta9-THC for 21 days (10mg/kg/day) competitively inhibited the N-demethylase and O-demethylase activities, but had no inhibitory effect on aniline hydroxylase. Under in vitro conditions of drug treatment at doses of 2, 4, and 8mcg/mg of protein, two demethylase activities were found to be inhibited in a competitive manner, whereas comparatively less and mixed type of inhibition was observed with aniline hydroxylase only at higher doses of the drug. These results suggest that delta9-THC changes the conformation of the hepatic microsomal membrane in a characteristic way, and there exists a qualitative difference between the two substrate binding sites of the microsomal membrane regarding their interaction with a highly lipophilic drug like delta9-THC. 14 references. (Author abstract)

243440 Jimerson, David C.; Post, Robert M.; Skyler, Jay; Bunney, William E., Jr. Section on Psychobiology, Adult Psychiatry Branch, NIMH, Bethesda, MD 20014 A preliminary report: neuroendocrine effects of dopamine and norepinephrine receptor stimulators. Bethesda, MD, NIMH, 1975. 5 p.

A preliminary report on the neuroendocrine effects of dopamine and norepinephrine receptor stimulators is presented. Data are reported for a series of experiments which tested: 1) the possibility that a low dose of piribedil might raise plasma prolactin levels by acting selectively at presynaptic dopamine receptors; 2) the effect of clonidine on plasma prolactin levels; and 3) whether there are consistently measurable levels of prolactin in depressed patients, and the relationship of such levels to homovanillic acid (HVA) levels. The data demonstrate consistently measurable prolactin levels in cerebrospinal fluid (CSF) in depressed patients, suggesting that spinal fluid may play an active role in the neuroendocrine regulatory system. The observed decrease in CSF prolactin with piribedil apparently reflects direct dopamine receptor stimulation by the drug, while decreased HVA accumulations represent a secondary decrease in dopamine synthesis. Increased CSF prolactin in the patients treated with pimozide seems to indicate effective dopamine receptor blockade in spite of inconsistent HVA alterations. These data suggest that CSF prolactin levels and HVA accumulations reflect different aspects of central dopamine function. 3 references.

243482 Schubert, David; Tarikas, Helgi; LaCorbiere, Monique. Dept. of Neurobiology, Salk Institute, San Diego, CA 92112 Neurotransmitter regulation of adenosine 3',5'-monophosphate in clonal nerve, glia, and muscle cell lines. *Science*. 192(4238):471-472, 1976.

The effects of neurotransmitters on the adenosine-3',5'-monophosphate (cAMP) content of clonal cell cultures were examined. Results indicate that of the seven neurotransmitters or transmitter analogs examined, only dopamine and norepinephrine had a stimulatory effect on cAMP; dopa, gamma-aminobutyric acid, histamine, carbamylcholine, and 5-hydroxytryptamine had no significant effects. Norepinephrine increased the intracellular level of cAMP in clonal cell lines of nerve, glia, smooth muscle, and skeletal muscle. The largest response was in skeletal muscle, where the cyclic nucleotide concentration was elevated more than 500 fold. Glia and muscle cells, but not nerve cells, responded to dopamine with increased cyclic AMP accumulation. This response appears to be mediated through a beta-adrenoreceptor. 21 references. (Author abstract modified)

243483 Creese, Ian; Burt, David R.; Snyder, Solomon H. Dept. of Pharmacology, Johns Hopkins University School of Medicine, Baltimore, MD 21205 Dopamine receptor binding predicts clinical and pharmacological potencies of antischizophrenic drugs. *Science*. 192(4238):481-483, 1976.

The correlation between the dopamine receptor affinities of a series of butyrenophones, phenothiazines, and other dopamine antagonists with their pharmacological activities in animal behavioral tests and their clinical potencies in psychiatric patients was examined. Using tritiated haloperidol and tritiated dopamine to label postsynaptic dopamine receptors in mammalian brain, it was determined that the clinical potencies of these drugs correlate closely with their ability to inhibit tritiated haloperidol binding. These binding methods provide a simple in vitro means for evaluating new drugs as potential antischizophrenic agents. 13 references. (Author abstract modified)

243759 Lees, P.; Serrano, L. Dept. of Physiology, Royal Veterinary College, Hawkshead hore, North Mymms, Hatfield, Herts, England Effects of azaperone on cardiovascular and respiratory functions in the horse. *British Journal of Pharmacology* (London). 56(3):263-269, 1976.

The pharmacological actions of azaperone on cardiovascular and respiratory functions of the horse were investigated. Results indicate that arterial blood pH, carbon dioxide tension (PaCO₂) and oxygen tension (PaO₂) remained relatively constant throughout the course of action of azaperone. Azaperone did not modify plasma protein concentration, but venous blood packed cell volume and hemoglobin concentration were reduced by 5% to 10% for at least 4 hours. These changes were probably caused by uptake of erythrocytes into the splenic reservoir. Small increases in heart rate occurred for up to 60 minutes after administration of the drugs, and this was followed by a slight bradycardia in some ponies. Azaperone reduced mean arterial blood pressure (MAP) for at least 4 hours, by which time its ataractic action was generally no longer apparent. The hypotension was caused, during the early phase of action at least, by a reduction in peripheral resistance, since cardiac output was increased slightly 20 minutes after its administration. Possible mechanisms underlying the cardiovascular changes are discussed. In spite of reductions in arterial blood oxygen content and MAP produced by azaperone, it is likely that tissue oxygenation was adequate, since arterial blood lactate concentrations were not increased. 27 references. (Author abstract modified)

243760 Dorris, R. L.; Shore, P. A. Dept. of Pharmacology, University of Texas Health Science Center, Dallas, TX 75235 On the mechanism of action of clozapine on the adrenergic neuron. *British Journal of Pharmacology* (London). 56(3):279-283, 1976.

In a study of the mechanism of action of clozapine on the adrenergic neuron, resulted that the drug lowered noradrenaline and metaraminol (MA) concentrations in the rat heart. This action was blocked by the presence of a ganglionic blocking drug. Other alpha-adrenoceptor blocking drugs (phenoxybenzamine, phentolamine) did not significantly lower heart amine concentrations. An inhibitor of neuronal amine uptake (desipramine) caused only a slight lowering. The combination of phentolamine and desipramine showed considerable activity, and this action was blocked by ganglionic blockade. Clozapine had little or no action in blocking amine uptake, yet greatly potentiated amine release caused by the phentolamine/desipramine combination. Other antipsychotic drugs (haloperidol, chlorpromazine, thioridazine) or other agents (propranolol, atropine) did not share this action of clozapine. Ganglionic blockade markedly delayed amine release induced by reserpine administration. It is suggested that clozapine may have an incomplete reserpine like effect specifically on the adrenergic neuron, facilitating impulse induced amine release. 16 references. (Author abstract modified)

243761 Rivera-Calimlim, Leonor. Dept. of Pharmacology and Toxicology Univ. of Rochester, School of Medicine and Dentistry, Rochester, NY 14642 Impaired absorption of chlorpromazine in rats given trihexyphenidyl. *British Journal of Pharmacology* (London). 56(3):301-305, 1976.

The absorption and tissue distribution of orally administered 14C-chlorpromazine (CPZ) were compared in trihexyphenidyl (THP) treated and control rats. Results indicate that total radioactivity (CPZ) in the plasma and brain of rats treated with THP was significantly lower, whereas total radioactivity in the stomach was significantly higher, than in rats not previously treated with THP. Gastric emptying in rats treated with THP was significantly delayed as measured by gastric clearance of a marker 14C-polyethylene glycol. Transport of 14C-CPZ in everted sacs was not affected by treatment with THP, and metabolism of 14C-CPZ by liver homogenates was not affected by treatment with THP. The relationship of delayed gastric emptying in THP treated rats and their lower plasma and brain levels of 14C-CPZ after oral administration is discussed. 14 references. (Author abstract)

243762 Cutis, D. R.; Game, C. J. A.; Lodge, D. Dept. of Pharmacology, Australian National University, Canberra, Australia Benzodiazepines and central glycine receptors. *British Journal of Pharmacology* (London). 56(3):307-311, 1976.

The interactions between diazepam, strychnine and glycine were examined in the cat and the mouse. Results indicate that in cats anesthetized with pentobarbitone, intravenous diazepam enhanced dorsal root potentials but did not significantly diminish the reduction by electrophoretic strychnine of the inhibitory action of electrophoretic glycine on dorsal horn interneurons. In mice, intraperitoneal diazepam had no appreciable effect on the potency of strychnine as a convulsant, although it provided some protection against bicuculline. These observations, together with the failure of chlordiazepoxide to either inhibit the firing of spinal interneurons or reduce antagonism between strychnine and glycine when administered locally, provide no support for the interaction between benzodiazepines and mammalian central glycine receptors which has been proposed on the basis of in vitro studies of strychnine binding. 11 references. (Author abstract modified)

243777 Rochette, L.; Bralet, J. Laboratoire de Pharmacodynamie et Physiologie pharmaceutique, Faculté de Médecine et Pharmacie, 7 Bd. Jeanne d'Arc, F-21000 Dijon, France Effect of the norepinephrine receptor stimulating agent "clonidine" on the turnover of 5-hydroxytryptamine in some areas of the rat brain. *Journal of Neural Transmission (Berlin)*. 37(4):259-267, 1975.

The modifications of 5-hydroxytryptamine (5-HT) synthesis and release in some areas of the rat brain were studied. Clonidine (0.05mg/kg) produced a 23% decrease in 5-hydroxyindoleacetic acid (5-HIAA) level and a 7% increase in 5-HT level in the whole brain and a 9% increase in 5-HT level in a discrete cerebral region. Rises in 5-HT levels induced by pargyline injection were increased by clonidine 35% in the brainstem and 15% in the hypothalamus. Findings show that clonidine primarily reduced the release of 5-HT without an immediate effect on its synthesis. The hypothesis that norepinephrine receptor stimulation inhibits the activity in the 5-HT neurons was supported. 29 references.

243778 Meyerson, Laurence R.; McMurtrey, Kenneth D.; Davis, Virginia E. Neurochemistry and Addiction Research Laboratory, VA Hospital, Houston, TX 77211 Neuroamine-derived alkaloids: substrate-preferred inhibitors of rat brain monoamine oxidase *in vitro*. *Biochemical Pharmacology (Oxford)*. 25(9):1013-1020, 1976.

The effects of tetrahydropapaveroline (THP), salsolinol (SAL), and various hydroxylated and methoxylated tetrahydropapaveroline (THPB) alkaloids on monoamine oxidase (MAO) forms A and B in rat brain homogenates were investigated. The findings indicate that SAL and the tetrahydroxyberberines were substrate preferred inhibitors of type-A MAO, whereas THP was a relatively nonspecific inhibitor of rat brain MAO. Kinetic data reveal that THP, SAL and 2,3,10,11-tetrahydroxyberberine inhibited the oxidation of serotonin in a typical competitive manner. THP and SAL non-competitively inhibited benzylamine oxidation, while 2,3,10,11-tetrahydroxyberberine competitively inhibited the oxidation of benzylamine. Sequential replacement of the hydroxyl groups at the 2, 3, 9, 10 and 11 positions of the berberine ring system by methoxyl groups substantially decreased the potency and selectivity of MAO inhibition. The interaction of these alkaloids with the metabolic pathways of neurotransmitters suggests that these compounds may be of relevance in the modification of central synaptic function. 83 references. (Author abstract modified)

243779 Anderson, Thomas R.; Slotkin, Theodore A. Department of Physiology and Pharmacology, Duke University Medical Center, Durham, NC 27710 The role of neural input in the effects of morphine on the rat adrenal medulla. *Biochemical Pharmacology (Oxford)*. 25(9):1071-1074, 1976.

The role of neural input in the effects of morphine on the rat adrenal medulla was examined in rats with denervated left and right adrenal glands. Rats were treated with morphine twice daily, and the individual adrenals were analyzed for catecholamine (CA) content and for tyrosine hydroxylase (TH) and dopamine-beta-hydroxylase (DBH) activities. After one day of treatment at a low dosage level, neither side demonstrated any change in CA, but DBH was increased in both; TH was elevated only in the intact side. After one week of treatment, CA levels were elevated only slightly in both intact and denervated adrenals, while the effect on DBH was more marked. While TH was increased in the innervated side by more than 50%, there was only a small increase in TH in the denervated adrenal. In the denervated adrenal, there were

only slight increases in CA and TH after chronic administration of the higher doses, while DBH activity was markedly elevated during chronic administration of 40mg/kg but declined toward control levels during chronic treatment with 100mg/kg. These data indicate that most of the morphine induced increases in TH activity and CA content result from increased stimulation of the splanchnic nerve. Morphine also exerts a direct effect on the adrenal medulla which influences DBH activity primarily. The direct action of morphine may display tolerance, while the increase splanchnic stimulation does not. 26 references. (Author abstract modified)

243780 Roerig, David L.; Reak, Constance J.; Wang, Richard I. H. Pharmacology Research Laboratory 151, VA Center, Wood, WI 53193 Enzymatic conversion of morphine to pseudomorphine. *Biochemical Pharmacology (Oxford)*. 25(9):1075-1080, 1976.

The interaction of morphine with an enzymatic oxidation reduction system was investigated. After incubating (¹⁴C)morphine with horseradish peroxidase and hydrogen peroxide, two radioactive compounds were detected. One compound corresponded to morphine. Using spectral analysis, the other ¹⁴C labeled compound was identified as pseudomorphine, a dimerized oxidation product of two molecules of morphine. Using compounds structurally related to morphine it was determined that: 1) a free phenolic hydroxyl group in position 3 was necessary for the enzymatic oxidation of morphine to pseudomorphine; 2) a carbonyl group in position 6 of the morphinan ring prevents the formation of the dimer; and 3) substitution of other functional groups on the morphine molecule did not affect the peroxidase catalyzed dimerization. The nature of peroxidase enzymes and the phenolic character of morphine suggest that the formation of pseudomorphine proceeds through a morphine free radical intermediate. 22 references. (Author abstract modified)

243782 Ghosh, Amal K.; Ito, Tatsuji; Ghosh, Sabita; Sloviter, Henry A. Harrison Department of Surgical Research, School of Medicine, Univ. of Pennsylvania, Philadelphia, PA 19174 Effects of dimethylsulfoxide on metabolism of isolated perfused rat brain. *Biochemical Pharmacology (Oxford)*. 25(9):1115-1117, 1976.

The changes in the metabolism of isolated rat brain during perfusion with fluid containing dimethylsulfoxide (DMSO) were examined. Results indicate that DMSO produced an increase in the rate of brain glycolysis and a small decrease in the tissue energy reserves such as the concentrations of creatine phosphate in the brain. In addition, a decrease in the lactate/pyruvate ratio was found, suggesting a marked shift to a reduced state in the tissue. It is suggested that DMSO reduced the utilization of oxygen by an inhibitory effect on mitochondrial function. The results show that both glucose consumption and lactate production increased in the brains perfused with DMSO, but the increase in lactate production did not account for all of the increased glucose utilization. It is concluded that DMSO might produce these effects by increasing the normally low level of activity of the pentose phosphate shunt. 13 references.

243787 Harvey, D. J.; Paton, W. D. M. Department of Pharmacology, University of Oxford, South Parks Road, Oxford OX1 3QT, England Characterization of three monohydroxyacid and two dihydroxyacid metabolites of delta1-tetrahydrocannabinol in mouse liver. *Research Communications in Chemical Pathology and Pharmacology*. 13(4):585-599, 1976.

Deltatetrahydrocannabinol-7-oic acid (deltat-THC), together with its 2", 3" and 6 alpha-monohydroxy and 2", 6 alpha and 3", 6 alpha-dihydroxy derivatives was characterized by combined gas chromatography and mass spectrometry in organic extracts of mouse liver following large dose of deltat-THC. The results show that the mouse is capable of hydroxylating deltat-THC in the 6 and 7 positions of the terpene ring and the 2' and 3' positions of the pentyl sidechain. Oxidation of the 7-hydroxyl group to a carboxylic acid is a major metabolic pathway. Most of the major biotransformation products were substituted in several positions as a result of repeated biliary excretion and reabsorption. 15 references. (Author abstract modified)

243789 Joffe, Justin M.; Peterson, John M.; Smith, Durwood J.; Soyka, Lester F. Department of Pharmacology, University of Vermont College of Medicine, Burlington, VT 05401 Sublethal effects on offspring of male rats treated with methadone. Research Communications in Chemical Pathology and Pharmacology. 13(4):611-621, 1976.

In a study of the sublethal effects on offspring of male rats treated with methadone (METH) before mating, it was found that ingestion of METH by male rats prior to mating greatly increased the neonatal death rate of their offspring. Male rats were allowed drinking water containing METH for 24 hours, alone or in the presence of females, and then mated with drug naive females. When both males and females were exposed to METH the frequency of matings was decreased. Offspring of METH males were lighter in weight at birth and at weaning, particularly if their sires had been exposed to females during the period of METH ingestion. Although the neonatal death rate of the METH offspring was more than twice that of controls this difference was not statistically significant. The enhancement of METH effects by concurrent exposure to females leads to the proposal that the locus of action of METH is the developing spermatozoa. 4 references. (Author abstract)

243790 Schwark, W. S.; Keesey, R. R. Department of Physiology, New York State College of Veterinary Medicine, Cornell University, Ithaca, NY 14853 Influence of thyroid hormone on norepinephrine metabolism in rat brain during maturation. Research Communications in Chemical Pathology and Pharmacology. 13(4):673-683, 1976.

The effect of thyroid hormone on norepinephrine (NE) metabolism was investigated in various regions of the developing rat brain. Neonatal hypothyroidism, induced by daily propylthiouracil injection starting at birth, caused an increase in NE levels in the brainstem and hypothalamus. The turnover of brain NE, as indicated by its rate of depletion following alpha-methyl-p-tyrosine administration, was decreased in the hypothalamus of 30-day-old hypothyroid rats but was unchanged in the brainstem and basal ganglia. The activities of monoamine oxidase (MAO) and catechol-o-methyl transferase (COMT) were decreased in certain brain regions of hypothyroid rats. The data suggest that thyroid hormone may influence the ontogenic patterns of NE metabolism in the brain. 26 references. (Author abstract)

243791 Levin, Barry E.; Sadowsky, Carol H.; Stolk, Jon M. Department of Medicine, Dartmouth Medical School, Hanover, NH 03755 Axoplasmic transport of norepinephrine in the rat brain. Life Sciences (Oxford). 18(8):837-840, 1976.

Axoplasmic transport of norepinephrine was examined in the rat brain. (3H)Norepinephrine was synthesized from (3H)dopamine injected stereotactically into the locus coeruleus

of the rat, and subsequently was transported to the anterior hypothalamus at a rate of 0.9mm/hr. Transport occurred within the median forebrain bundle and was blocked by 6-hydroxydopamine induced lesions in the bundle. 14 references. (Author abstract)

243792 Rastogi, Ram B.; Singhal, Radhey L. Department of Pharmacology, Faculty of Medicine, University of Ottawa, Ottawa, Ontario, Canada K1N 9A9 Neonatal hyperthyroidism: alterations in behavioural activity and the metabolism of brain norepinephrine and dopamine. Life Sciences (Oxford). 18(8):851-857, 1976.

In a study of neonatal hyperthyroidism, daily administration of triiodothyronine to newborn rats for 30 days produced signs of hyperthyroidism which included accelerated development of physical and behavioral characteristics accompanying maturation. The hyperthyroid rats displayed progressive increases in spontaneous locomotor activity between 14-35 days, which remained elevated well above control levels even at 105 days. Exposure of developing rats to triiodothyronine increased the endogenous levels of striatal tyrosine and tyrosine hydroxylase as well as the concentration of dopamine in hypothalamus, pons medulla, midbrain, striatum and hippocampus. The concentration of striatal homovanillic acid and 3,4-dihydroxyphenylacetic acid was also increased in hyperthyroid rats. The steady state levels of norepinephrine remained unaltered, resulting in a significant increase in dopamine to norepinephrine ratio in several regions of the brain examined. The elevated levels of dopamine metabolites (homovanillic acid and 3,4-dihydroxyphenylacetic acid) may be due to an increased turnover of dopamine. The data suggest that increased thyroid hormone levels may lead to an enhanced synthesis as well as utilization of brain catecholamines which in turn may underlie the observed increases in spontaneous locomotor activity. 21 references. (Author abstract)

243793 Ciaccio, Edward I.; De Vera, Herman. Department of Pharmacology, Hahnemann Medical College, Philadelphia, PA 19102 Effect of benzo(a)pyrene and chlorpromazine on aryl hydrocarbon hydroxylase activity from rat tissues. Biochemical Pharmacology (Oxford). 25(8):985-987, 1976.

The distribution and relative levels of aryl hydrocarbon hydroxylase (AHH) in nine rat tissues were examined in light of the induction response to two xenobiotics, benzo(a)pyrene (BP) and chlorpromazine (CP). The data indicate that from rats on a Purina Chow diet there is an endogenous AHH activity in the lymph node, prostate, salivary glands and lactating mammary gland in addition to those tissues previously reported. Although the endogenous levels of AHH are quite low in the extrahepatic tissues when compared to liver, after induction with phenobarbital, the fold increase in equal to or greater than that for liver. Upon treatment of rats with BP, the induced liver AHH activity becomes only 27 fold greater than lung and only 10 fold greater than kidney AHH activity. CP, a commonly used drug, given in one low dose can induce significantly lung and kidney as well as liver. The results indicate that AHH is an enzyme system which can be measured and induced in many rat tissues. This AHH activity is of importance not only in protective tissues of entry into the body but also in terms of focusing knowledge on carcinogenic intermediates of polycyclic hydrocarbons. 31 references.

243794 Simon, G.; Winter, M. Department of Pathophysiology, Semmelweis University Medical School, Budapest, Hungary The effect of sympatholytic and sympathomimetic agents on acetylcholinesterase and cholinesterase activity, in vitro. Biochemical Pharmacology (Oxford). 25(8):881-882, 1976.

The effects of different alpha and beta blockers and sympathomimetics on acetylcholinesterase (AChE) and cholinesterase (ChE) at physiological pH ranges were examined in rats. Alpha blocking drugs competitively inhibited AChE in rat blood cells and brain homogenates, but beta receptor blocking compounds were ineffective. The alpha blocking activity of the drugs does not correlate with their AChE inhibitory effect. Two compounds structurally similar to the sympathetic alpha blocking drugs but without any blocking effect on the receptors inhibited AChE noncompetitively. Only some of the sympathomimetic agents inhibited AChE. A few of the compounds tested also influenced serum ChE activity, but their ability to inhibit AChE and ChE was not parallel. 10 references. (Author abstract)

243795 Zatz, Martin; Romero, Jorge A.; Axelrod, Julius. Laboratory of Clinical Science, NIMH Bldg 10, Rm. 2D46, Bethesda, MD 20014 Diurnal variation in the requirement for RNA synthesis in the induction of pineal N-acetyltransferase. *Biochemical Pharmacology* (Oxford). 25(8):903-906, 1976.

In a study of diurnal variation in the requirement for ribonucleic acid (RNA) synthesis in the induction of rat pineal N-acetyltransferase, a variation in the lag period was observed when enzyme activity was induced in culture by dibutyryl cyclic adenosine monophosphate. Experiments with actinomycin D indicate that RNA synthesis occurred during the lag period. If actinomycin D was added after the lag period, however, it did not reduce the level of N-acetyltransferase activity attained. Reinductions in glands from animals which had been in the dark for 6 hours had no lag period and did not require RNA synthesis. The extent to which enzyme activity could be reinduced in culture in the presence of actinomycin D gradually increases during the first half of the night, when there was an increased release of norepinephrine from the nerve endings. These data suggest that RNA, presumably messenger RNA, that is necessary for increased N-acetyltransferase activity is synthesized and accumulates during the first half of the night. Thereafter, there appears to be a decline in the complement of RNA available for reinduction. 15 references. (Author abstract)

243796 Slotkin, Theodore A. Duke University Medical Center, Durham, NC 27710 Effects of reserpine on maturing adrenal medulla. Final Report, NIMH Grant MH-25093, 1975. 7 p.

The interaction of a useful sympatholytic agent, reserpine, with maturing adrenergic tissue was investigated. Two basic approaches were used: the way the level of development of the adrenal medulla influences the actions of reserpine, and the way reserpine administration alters the subsequent development of the tissue. Studies with developing rats indicated effects of reserpine completely different from those seen in adults, consisting of acute, nonneural depletion and no compensatory induction of catecholamine biosynthetic enzymes. This illustrates the marked age dependence of the action of reserpine and the fact that knowledge of the effects in mature animals does not necessarily enable prediction of developmental effects. While further study is required to define the actions of reserpine on sympathoadrenal development, a marked delay was observed in maturational increases in catecholamine stores in reserpine treated neonates. 2 references.

243797 Allen, George S.; Gross, Carol J.; Henderson, Lavell M.; Chou, Shelley N. Department of Neurosurgery, Johns Hopkins Hospital, 601 North Broadway, Baltimore, MD 21205

Cerebral arterial spasm. Part 4: in vitro effects of temperature, serotonin analogues, large nonphysiological concentrations of serotonin, and extracellular calcium and magnesium on serotonin-induced contractions of the canine basilar artery. *Journal of Neurosurgery*. 44(5):585-593, 1976.

A small volume chamber was employed to study serotonin induced contractions of the canine basilar artery in vitro. Temperature was found to have profound effect on the artery's response to serotonin. Raising the temperature to 40 degrees C increased the maximum response by 20%, and lowering the temperature by 10 degrees C caused a 40% reduction in the maximum contraction. Cumulative log dose/response curves for analogues of serotonin demonstrated a high degree of specificity for the serotonin receptor and large nonphysiological concentrations of serotonin caused relaxation of the contracted artery. Extracellular calcium was shown to be an absolute requirement for serotonin induced contractions. Extracellular magnesium, in contrast, was shown to inhibit serotonin induced contractions. 14 references. (Author abstract)

243798 Bosin, T. R.; Hixson, E. Jane; Maickel, R. P. Department of Pharmacology, Medical Sciences Program, Indiana University, Bloomington, IN 47401 Pressor effects of tryptamine analogues. *British Journal of Pharmacology* (London). 56(1):25-27, 1976.

In a study of the pressor effects of tryptamine analogs, it was found that methylation of tryptamine in the 1 position had little effect on the potency of the drug as a pressor agent in the intact anesthetized rat. In contrast, substitution of a benzo(b)thiophene ring system for the indole ring decreased the pressor activity. Pretreatment of the animals with reserpine reduced the pressor effect of tryptamine and its benzo(b)thiophene analog while increasing the effect of the 1-methylindole analog. Pretreatment with phenoxybenzamine reduced the pressor effect of all three compounds. 13 references. (Author abstract)

243799 Osborne, N. N.; Pentreath, V. W. Max-Planck-Institut für experimentelle Medizin, Forschungsstelle Neurochemie, 3400 Göttingen, Germany Effects of 5,7-dihydroxytryptamine on an identified 5-hydroxytryptamine-containing neurone in the central nervous system of the snail *Helix pomatia*. *British Journal of Pharmacology* (London). 56(1):29-38, 1976.

The effect of 5,7-dihydroxytryptamine (5,7-DHT) on an identified 5-hydroxytryptamine (5-HT) containing neuron in the central nervous system of the snail (*Helix pomatia*) was studied by histochemical, biochemical and electrophysiological methods. Low concentrations of 5,7-DHT decreased the endogenous 5-HT content of the neuron without affecting the amino acids, while relatively large amounts of the drug proportionately lowered 5-HT and in addition slightly decreased the tryptophan and methionine content of the cell. 5,7-DHT blocked the uptake of (3H)-5-HT into the neuron; the close analog 5,6-DHT was more potent. As well as slightly influencing the accumulation of (3H)-tryptophan by the neuron 5,7-DHT inhibited the metabolism of this amino acid to form 5-HT, probably by affecting the enzyme tryptophan hydroxylase. 5,7-DHT produced a postsynaptic blockade of transmission from the neuron by blocking the 5-HT receptors of the follower neurons. This effect appeared to be specific for 5-HT receptors. The data support the idea that 5,7-DHT is neurotoxic for indoleamine containing neurons. 32 references. (Author abstract)

243800 Adams, M. D.; Chait, L. D.; Earnhardt, J. T. Dept. of Pharmacology, Health Sciences Div., Medical College of Virginia, Richmond, VA 23298 **Tolerance to the cardiovascular effects of delta9-tetrahydrocannabinol in the rat.** *British Journal of Pharmacology* (London). 56(1):43-48, 1976.

In a study of tolerance to the cardiovascular effects of delta9-tetrahydrocannabinol (THC) in the rat, daily intraperitoneal injections of THC resulted in tolerance to the effects of the cannabinoid on bodyweight and body temperature within 1-2 weeks of treatment. Tolerance failed to develop to the suppression of spontaneous motor activity produced by THC during 28 days of treatment with the cannabinoid. Following treatment with vehicle for 28 days, intravenous administration of THC in anesthetized rats produced a transient pressor response followed by a sustained hypotension and bradycardia. Tolerance to the hypotensive and negative chronotropic responses to intravenous THC was readily apparent in animals which had received daily intraperitoneal injections of THC. Tolerance failed to develop to the pressor actions of intravenous THC after 28 days of pretreatment. There was no difference in the pressor response to intravenous noradrenaline in vehicle treated animals and THC treated animals. 24 references. (Author abstract)

243801 Gilbert, J. C.; Wyllie, M. G. Department of Pharmacology, University of Aberdeen, Foresterhill, Aberdeen, AB9 2ZD, Scotland **Effects of anticonvulsant and convulsant drugs on the ATPase activities of synaptosomes and their components.** *British Journal of Pharmacology* (London). 56(1):49-57, 1976.

The effects of anticonvulsants, and other drugs on the sodium (Na⁺), potassium (K⁺) adenosine triphosphatase (ATPase) (ouabain sensitive) and magnesium (Mg⁺⁺) ATPase activities of synaptosomes and their components have been determined. The Mg⁺⁺ + ATPase activity of synaptosomes was not affected by the drugs but the Na⁺, K⁺ ATPase activity was inhibited by phenytoin (diphenylhydantoin), ethosuximide and diazepam. Fractions containing mainly membranes, mitochondria or synaptic vesicles, were prepared for synaptosomes by osmotic shock and subsequent density gradient centrifugation. Inhibition of Na⁺, K⁺ + ATPase activity by phenytoin, ethosuximide and diazepam was apparent only in the membrane fraction. The fraction containing synaptic vesicles exhibited pronounced Mg⁺⁺ + ATPase but no Na⁺, K⁺ + ATPase activity. In contrast to the enzymes of the membranes and mitochondria, the Mg⁺⁺ + ATPase of the vesicles was inhibited by diazepam and all of the anticonvulsants tested. 39 references. (Author abstract—)

243805 Stone, T. W. Dept. of Physiology, University of Aberdeen, Marischal College, Aberdeen, Scotland **Responses of neurones in the cerebral cortex and caudate nucleus to amantadine, amphetamine and dopamine.** *British Journal of Pharmacology* (London). 56(1):101-110, 1976.

The effects of dopamine, amantadine and amphetamine applied directly by microiontophoresis to single neurons in the caudate nucleus and cerebral cortex of rats anesthetized with urethane were studied. The predominant response to all three agents was a depression of neuronal firing rate. The responses to dopamine and amantadine could be antagonized by the dopamine receptor blocking agent, chlorpromazine. Amantadine did not cause any potentiation of dopamine responses, suggesting that inhibition of amine uptake was not responsible for its effects. The responses of pyramidal tract cells in the cerebral cortex to dopamine, amphetamine and amantadine were compared in control groups of rats and rats pretreated

with reserpine or alpha-methyl-p-tyrosine methyl ester. Responses to dopamine were unaltered in the amine depleted animals compared with controls. Responses to amantadine and amphetamine were reduced but not abolished. It is concluded that amantadine acts partly by releasing catecholamines from neuronal stores. The residual responses to amantadine acts partly by releasing catecholamines from neuronal stores. The residual responses to amantadine and amphetamine may be the result of a direct postsynaptic receptor stimulation. 61 references. (Author abstract modified)

243813 Meltzer, Herbert Y. Dept. of Psychiatry, Box 411, Univ. of Chicago, Pritzker School of Medicine, 950 East 59th Street, Chicago, IL 60637 **Skeletal muscle necrosis following membrane-active drugs plus serotonin.** *Journal of the Neurological Sciences* (Amsterdam). 28(1):41-56, 1976.

The skeletal muscle necrosis produced in male rats given serotonin (5-HT) were studied after pretreatment with imipramine, other tricyclic antidepressants, or antihistamines. Following one of these agents plus 5-HT, necrosis was more severe in the soleus muscle than the quadriceps. After one of these agents plus 5-HT i.p., but not 5-HT s.c., extensive necrosis was significantly more frequent and severe in the quadriceps muscle than after 5-HT s.c. Chlorpheniramine (CP) plus 5-HT i.v. produced less muscle necrosis than CP plus 5-HT s.c. or i.p. The muscle necrosis produced by CP plus 5-HT is blocked by some 5-HT blockers, e.g., methiopein and methysergide. It is also partially blocked by denervation. The capacity of tricyclic antidepressants and antihistamines to block neuronal 5-HT reuptake tended to be negatively correlated with the capacity to potentiate the muscle necrosis they produced with 5-HT, which suggests that blockade of 5-HT uptake is not the mechanism of the pathology produced by the combined treatment. It is proposed that the effects of imipramine plus 5-HT on skeletal muscle are not due to the blockade of neuronal uptake of 5-HT and subsequent vascular induced ischemia, but reflect direct toxic effects of these agents on skeletal muscle. 32 references. (Author abstract modified)

243814 Weichsel, Morton, E. Jr.; Trosko, James E. Department of Pediatrics, Harbor General Hospital, 1000 W. Carson Street, Torrance, CA 90509 **In vivo reversal of thyroxine induction of DNA synthesis by dibutyryl cyclic AMP in developing rat cerebellum.** *Journal of Neurological Sciences* (Amsterdam). 28(1):77-82, 1976.

The reversal of thyroxine induction of deoxyribonucleic acid (DNA) synthesis by dibutyryl cyclic adenosine monophosphate (AMP) in the developing rat cerebellum is reported. Cerebellar weight and DNA content were affected more severely than bodyweight in cyclic-AMP treated animals, with cerebellar DNA reduced significantly to 88% of control values. Cerebellar DNA was significantly elevated to 117% of control values in thyroxine treated animals. This augmentation of cerebellar DNA synthesis by thyroxine was negated by administration of dibutyryl cyclic-AMP 10 min prior to the thyroxine injection. These results support a hypothesis that the enhancement of cerebellar cell division by thyroxine involves an increase in the ratio of intracellular cyclic guanosine monophosphate to cyclic adenosine monophosphate. The reversal of the thyroxine induced increase in cerebellar DNA synthesis by a prior injection of dibutyryl cyclic-AMP suggests that the early stimulation of cell division by thyroxine may be mediated by cyclic-AMP and that the intracellular balance between cerebellar cyclic-AMP and cyclic guanosine monophosphate was distorted by in vivo elevation of intracellular cyclic-AMP levels. 14 references. (Author abstract modified)

243815 Van Zoeren, Janet G.; Stricker, Edward M. Department of Biology, University of Pittsburgh, Pittsburgh, PA 15601 Thermal homeostasis in rats after intrahypothalamic injections of 6-hydroxydopamine. *American Journal of Physiology*. 230(4):932-939, 1976.

In a study of thermal homeostasis, specific destruction of at least 90% of the noradrenergic neurons in the preoptic/anterior hypothalamic region (PO/AH) by local injection of 6-hydroxydopamine (6-OHDA) did not disrupt thermoregulation by rats either in the heat or the cold. Examination of the multiple effector mechanisms suggested that thermal balance was maintained in a normal fashion, and that compensatory adjustments did not conceal individual dysfunctions. In contrast with the ineffectual 6-OHDA lesions of the PO/AH were the outstanding impairments seen in rats following electrolytic lesions of this area. All the latter animals became severely hyperthermic during the first hour of exposure to an ambient temperature of 40 degrees C, and half of them were additionally unable to maintain body temperatures when exposed to an ambient temperature of 6 degrees C. The electrolytic lesions reduced norepinephrine levels in the PO/AH, but the 50-70% depletions were substantially smaller than those found in 6-OHDA treatment rats. 48 references. (Author abstract)

243848 Marley, E.; Whelan, Jennifer E. Dept. of Pharmacology, Institute of Psychiatry, De Crespigny Park, London SE5 8AF, England Some pharmacological effects of p-chlorophenylalanine unrelated to tryptophan hydroxylase inhibition. *British Journal of Pharmacology* (London). 56(2):133-144, 1976.

A variety of tissues from different species were examined to establish whether or not the properties of p-chlorophenylalanine methyl ester (PCPA) include a 5-hydroxytryptamine (5-HT) like action which might explain the soporific action of PCPA in chicks. PCPA, like 5-HT, contracted the rat fundal preparation (as did PCPA base), and in cats enhanced twitch tension of a lower limb flexor reflex, evoked adrenal medullary secretion and attenuated histamine induced gastric secretion; the effects on the rat fundal strip and to adrenal medulla were prevented by methysergide. Like 5-HT, PCPA elicited bronchoconstriction of guinea pig lungs, isolated or in vivo; this was not prevented by methysergide but reduced by polyphlorethin and by indomethacin. Perfusate collected from the lungs during PCPA induced bronchoconstriction and applied to superfused isolated tissues contained a substance with prostaglandin like activity. In contrast, the effect of PCPA on the guinea pig isolated ileum differed from that of 5-HT, since it relaxed the ileum when contracted by transmural excitation, by acetylcholine, histamine or 5-HT and contracted the ileum on washout. 34 references. (Author abstract)

243849 Evans, Jane P. M.; Grahame-Smith, D. G.; Green, A. R.; Tordoff, Ann F. C. MRC Unit, Radcliff Infirmary, Oxford OX2 6HE, England Electroconvulsive shock increases the behavioural responses of rats to brain 5-hydroxytryptamine accumulation and central nervous system stimulant drugs. *British Journal of Pharmacology* (London). 56(2):193-199, 1976.

The effects of short-term and long-term electroconvulsive shock (ECS) on the functional activity of 5-hydroxytryptamine (5-HT) in the rat brain were examined. A single ECS of 150 v for one second increased the concentration of rat brain 5-hydroxyindoleacetic acid (5-HIAA) but did not alter brain (5-HT) or tryptophan concentrations 3 hours later. A single ECS decreased 5-HT synthesis 3 and 6 hours later. Synthesis was back to normal after 24 hours. Twenty four hours after the final ECS of a series of 10 shocks given once daily, rats were given tranlycypromine and L-tryptophan. They displayed

greater hyperactivity than control rats not treated with ECS, suggesting that ECS increased 5-HT functional activity. The hyperactivity following administration of the 5-HT agonist 5-methoxy N,N-dimethyltryptamine was enhanced by repeated ECS, suggesting altered postsynaptic responses to 5-HT receptor stimulation. Repeated ECS enhanced locomotor activity following tranlycypromine and L-dopa. It did not alter brain noradrenaline or dopamine concentrations. The latent period before pentylenetetrazol induced convulsions was shortened by repeated ECS. Following repeated ECS there appeared to be increased neuronal sensitivity to certain stimuli producing centrally mediated behavioral stimulation. This is discussed in relation to the mechanisms by which electroconvulsive therapy (ECT) produces its therapeutic effect. 22 references. (Author abstract modified)

243865 Solomon, Jolane; Cocchia, Mary Ann; Gray, Rebecca; Shattuck, Douglas; Vossmer, Anne. Biology Department, Boston College, Chestnut Hill, MA 02167 Uterotrophic effect of delta-9-tetrahydrocannabinol in ovariectomized rats. *Science*. 192(4239):559-561, 1976.

The estrogenic effects of delta-9-tetrahydrocannabinol (THC) in female rats were investigated, using the uterine weight gain and vaginal bioassays for estrogens. Ovariectomized female rats of the Charles River strain were injected intraperitoneally with either saline, sesame oil, estradiol benzoate (EB), or THC. Treatment with the appropriate compound was begun on the day of operation and continued daily for 14 days. At the termination of the experiment, the animals were killed and the uterus and adrenals were removed and weighed. It was found that chronic administration of THC had significant uterotrophic effects in ovariectomized rats as measured by the uterine weight gain bioassay for estrogens. 16 references. (Author abstract modified)

243882 Bunney, Benjamin S.; Aghajanian, George K. Department of Psychiatry, Yale University School of Medicine, New Haven, CT 06508 d-Amphetamine-induced inhibition of central dopaminergic neurons: mediation by a striato-nigral feedback pathway. *Science*. 192(4237):391-393, 1976.

Evidence is presented that a feedback pathway is the main mechanism by which d-amphetamine (d-AMPH), when administered intravenously in behaviorally relevant dose, induces the slowing of A9 dopamine neurons in the zona compacta of the substantia nigra and the ventral tegmental area in rats. It was found that lesions of the striato-nigral pathway markedly attenuate depressant effects of intravenous d-AMPH on A9 dopamine neuron activity. Coupled with previous findings, these results provide direct support for the hypothesis that the depressant effect of d-AMPH on these cells is mediated through a striato-nigral neuronal feedback loop. 21 references. (Author abstract modified)

243951 Chen, H. T.; Lu, K. H.; Meites, J. Department of Physiology, Michigan State University, East Lansing, MI 48824 Effects of hypo- and hyperthyroidism on 5-hydroxytryptophan and chlorpromazine-induced prolactin release in the rat. *Proceedings of the Society for Experimental Biology and Medicine*. 151(4):739-741, 1976.

The effects of hypothyroidism and hyperthyroidism on pituitary release of pituitary prolactin (PRL) in response to 5-hydroxytryptophan (5-HTP) and chlorpromazine (CPZ) were examined in rats. The increase of PRL release in response to 5-HTP and CPZ in thyroparathyroidectomized (THX) rats was smaller than in intact controls. Injection of a replacement dose of thyroxine (T4) to THX rats returned the PRL responses to

the two drugs to that of the intact controls, and treatment with enough T4 to produce hyperthyroidism increased the PRL response to the two drugs. The lower PRL response to the two drugs in the THX rats may be related to the marked reduction in pituitary PRL content, making less PRL available for release. The increased PRL response to these two drugs in the rats given the larger dose of T4 may be related to the higher initial pituitary PRL content in these rats. THX and a large dose of T4 also may alter the metabolism of 5-HTP and CPZ, as well as of catecholamines and 5-hydroxytryptamine in the hypothalamus. 15 references.

244043 Berner, P.; Karobath, M.; Scholtz, J. Psychiatrische Universitätsklinik, Lazarettgasse 14, A-1090 Vienna, Austria /The effect of amphetamine stereoisomers on the function of dopamine synapses in vitro./ Die Wirkung von Amphetamin-Stereoisomeren auf die Funktion von Dopaminsynapsen in vitro. Wiener Medizinische Wochenschrift (Wien). 125(21):338-340, 1975.

Results of an animal experiment on the effect of amphetamine stereoisomers on the function of dopamine synapses are discussed. Findings indicate that amphetamines reduce dopamine biosynthesis and tend to release or activate the catecholamine concentration. Positive stereoisomers of amphetamine have approximately four times the effect on the catecholamine biosynthesis as have negative isomers. In addition, amphetamine stereoisomers seem to have no effect on the basal activity of the enzyme adenylatecyclase, which acts as a dopamine biosynthesis stimulant. It is concluded that negative stereoisomers of amphetamine are not effective for Parkinson like symptoms, that the biosynthesis of catecholamines in the synaptosomes can be manipulated pharmacologically, and that the intrasynaptic amine balances can be changed. 13 references.

244060 Vesell, Elliot S. no address Psychopharmacologic agents: effect on drug metabolism. Final Report, NIMH Grant MH-21327, 1975. 10 p.

The relative stimulating potencies of different psychopharmacological agents on hepatic microsomal drug metabolizing enzymes (HMDME) were defined. Direct measurement of three separate hepatic microsomal proteins were used as yardsticks for estimating the relative stimulatory potencies. Adult male Sprague-Dawley rats were used as Ss. A large number of variables, such as dose and time of drug administration as well as inherent properties of the various agents themselves, were identified as contributing significantly to the stimulating potency of the psychopharmacological drugs. 33 references.

244072 Aghajanian, George K. Yale University, New Haven, CT 06520 Psychotogenic drug action on chemically defined neurons. Final Report, NIMH Grant MH-14459, 1975. 11 p.

Psychotogenic drug action on chemically defined neurons was investigated in albino rats. It was shown that various psychotogenic drugs have marked effects on the physiological activity of both presynaptic and postsynaptic neurons within brain monoamine systems. The cellular mechanisms of action of psychotogenic (or psychotomimetic) drugs were examined, and the effects of psychotogenic drugs on the physiological activity of single, histochemically identified neurons in the central nervous system were studied. Ultimately, such knowledge should contribute to the identification of systems in the brain which may be involved in the pathogenesis of naturally occurring psychoses such as schizophrenia. 88 references.

244089 Friedel, Robert O. Department of Psychiatry, Duke University School of Medicine, Durham, NC CNS phospholipid metabolism and neuronal function. Final Report, NIMH Grant MH-47408, 1975. 6 p.

Rat central nervous system (CNS) phospholipid metabolism was studied in vivo under varying physiological and pharmacological conditions, and regional and subcellular localization in the CNS of the observed effects on phospholipid metabolism by these factors was defined. All of seven putative neurotransmitters studied so far appear to cause specific alterations in rat brain phospholipid metabolism which are mediated through the respective receptor sites of each neurotransmitter. Some findings support the original premise that the specific neurotransmitter induced phospholipid changes observed in the brain reflect chemical alterations occurring at, or very close to, the cell membrane receptor sites. Clinical implications are discussed. 7 references.

244140 Bridgers, William F. University of Alabama Medical Center, University Station, Birmingham, AL 35294 Folic acid and behavior. Final Report, NIMH Grant MH-21042, 1975. 2 p.

The role of folic acid in synaptic events in the mammalian brain was investigated. Subcellular folate localization, characterization of folate derivitizations, and regional folate distribution were determined for mice. Brain folate turnover was also studied, and results are reported regarding folate uptake and forms, lack of synaptosomal specific localization, and actions of synaptosomal particulate and other brain fractions with folate pools. 6 references.

244199 Bonkowski, Lorne; Dryden, William F. Department of Physiology and Pharmacology, University of Strathclyde, Glasgow G1 1XW, Scotland The effects of putative neurotransmitters on the resting membrane potential of dissociated brain neurons in culture. Brain Research (Amsterdam). 107(1):69-84, 1976.

The sensitivity of disaggregated mouse brain cells maintained in culture in the absence of a metabolic inhibitor to known and putative central nervous system (CNS) transmitter substances and other drugs was examined. During culture, most cells were aggregated into either monolayer regions or thick cords joining monolayer regions. The neurons in the monolayer regions were distinguished from glial cells by differential staining, and were found to be the best subject for intracellular recording. Frequency distributions of resting membrane potentials of these cells proved to be reproducible in cultures of the same age, and were a useful index of sensitivity to bath applied drugs. Acetylcholine, dopamine, histamine, serotonin, and noradrenaline depolarized various neurons; gamma-aminobutyric acid (GABA) caused hyperpolarization, while glutamate and glycine had no significant effect. Antagonism of the responses to acetylcholine, dopamine, serotonin, and GABA was seen using atropine, pimozide, methysergide, and bicuculline respectively. It is concluded that dissociated brain neurons in culture show chemosensitivity and are potentially useful in pharmacological studies. 24 references. (Author abstract modified)

244200 Hendry, I. A. Department of Pharmacology, Australian National University, Canberra, Australia Effects of axotomy on the trans-synaptic regulation of enzyme activity in adult rat superior cervical ganglia. Brain Research (Amsterdam). 107(1):105-116, 1976.

The effects of surgical transection of the postganglionic nerve trunk of the superior cervical ganglion on the total

protein content and levels of the enzymes tyrosine hydroxylase, dopa decarboxylase, and choline acetyltransferase were studied in the adult rat. There was a minor decrease in the total activities of these three enzymes accompanied by a large increase in the total protein content of the ganglion. The transsynaptic induction of the enzyme tyrosine hydroxylase by reserpine was not affected by postganglionic axotomy. Increased activity mediated by reserpine caused no change in the total activities of either dopa decarboxylase or choline acetyltransferase. Previously observed effects of postganglionic axotomy on preventing transmission through the ganglion were compared with these results, and the possible mechanisms by which transsynaptic induction may occur are discussed. 51 references. (Author abstract)

244203 Duggan, A. W.; Hall, J. G.; Lee, C. Y. Department of Pharmacology, Australian National University, Canberra, Australia **Alpha-bungarotoxin, cobra neurotoxin and excitation of Renshaw cells by acetylcholine.** *Brain Research (Amsterdam)*. 107(1):166-170, 1976.

Alpha-bungarotoxin and cobra neurotoxin were administered from micropipettes in the vicinity of Renshaw cells of the cat to study possible effects of the cholinergic activation of these cells and their responses to acetylcholine and excitant amino acids administered electrophoretically. The effects of the neurotoxins were observed in 45 Renshaw cells. Ejection of the two snake neurotoxins had no significant effect in reducing cholinergic synaptic activation of Renshaw cells. No significant effect on chemical sensitivity was observed following ejection of the neurotoxins. The acetylcholine receptors of Renshaw cells have properties more related to those of sympathetic ganglia than to skeletal muscle, a proposal consistent with the failure of alpha-bungarotoxin and cobra neurotoxin to block activation of Renshaw cells and ganglion cells. It is concluded that these snake toxins will not make useful markers for the presence and distribution of nicotinic receptors in the vertebrate central nervous system. 15 references.

244205 Gahwiler, B. H. Biological and Medical Research Division, Sandoz, Basel, Switzerland **Diazepam and chlordiazepoxide: powerful GABA antagonists in explants of rat cerebellum.** *Brain Research (Amsterdam)*. 107(1):176-179, 1976.

The anticonvulsant property of benzodiazepines attributed to the enhancement of gamma-aminobutyric acid (GABA)-ergic presynaptic and postsynaptic inhibition was investigated in vitro. Diazepam and chlordiazepoxide were administered to explants of rat cerebellum, and the electrical activity of single Purkinje cells was recorded. Low concentrations of chlordiazepoxide elicited high frequency bursts and a small increase in the average firing rate of Purkinje cells, whereas higher concentrations depressed and eventually abolished the spontaneous discharges. The action of chlordiazepoxide was rapid in onset and partially reversible. Diazepam altered the spontaneous firing rate of Purkinje cells similarly as did chlordiazepoxide, but even lower concentrations of diazepam elicited an excitatory effect and the inhibition produced by high concentrations was only slowly reversible. The action of high concentrations of the benzodiazepines was not antagonized by specific GABA antagonists, neither did the benzodiazepines affect GABA agonists. The inhibitory effects of low concentrations of the benzodiazepines on GABA suggests a direct effect of the benzodiazepines on the Purkinje cell membrane.

244314 Quik, Maryka; Sourkes, Theodore L. Laboratory of Neurochemistry, Department of Psychiatry, McGill University, Montreal, Quebec, Canada **Regulation of adrenal tyrosine**

hydroxylase activity: neuronal versus local control studied with apomorphine. *Biochemical Pharmacology (Oxford)*. 25(10):1157-1166, 1976.

The relationship between catecholamine (CA) levels and adrenal tyrosine hydroxylase (TH) activity was studied in rats using apomorphine. Administration of apomorphine led to a temporary decrease in adrenal CA and a long-term increase in adrenal TH activity. The temporary decrease in adrenal CA was found due to increased secretion after apomorphine treatment, even though the concentration of injected apomorphine was sufficient to inhibit adrenal TH. The delayed increase in TH activity after apomorphine treatment was observed in hypophysectomized rats; however, it was abolished after splanchnic nerve transection. When apomorphine and L-3,4-dihydroxyphenylalanine (L-dopa) were administered simultaneously, there was no short-term decrease in adrenal CA content, but the increased TH activity was still observed. Also, the administration of alpha-methyl-para-tyrosine to rats decreased the concentration of adrenal CA, yet did not affect adrenal TH activity. It is proposed that increased nerve activity, and not adrenal CA concentrations, regulates the induction of adrenal TH. 52 references. (Author abstract modified)

244315 Orcutt, James C.; Molinoff, Perry B. University of Colorado Medical Center, Department of Pharmacology, 4200 East Ninth Avenue, Denver, CO 80220 **Endogenous inhibitors of dopamine-beta-hydroxylase in rat organs.** *Biochemical Pharmacology (Oxford)*. 25(10):1167-1174, 1976.

The endogenous inhibitors of dopamine-beta-hydroxylase (DBH) in rat organs were studied. An assay for endogenous inhibitors of DBH (DBHI) is described, as are the basic characteristics of the endogenous DBHIs in several rat organs. Inhibitory activity was detected in rat spleen and other organs. The inhibitory activity in homogenates of rat heart was reduced by treatment at 95 degrees, while most of that in the spleen was resistant to heat denaturation. Mixing experiments showed that there were constituents in heart homogenates which could cause the inhibitory activity in spleen to become heat labile. Divalent cations and the heme containing protein cytochrome c also conferred heat lability on the inhibitory activity in rat spleen homogenates. N-ethylmaleimide had no effect on the inhibitory activity in rat heart, spleen, or adrenal gland, but copper 2+ and -chloromercuribenzoate completely reversed the effects of the endogenous inhibitors in these organs. Sulfhydryl reagents can inhibit DBH, but there was no correlation between inhibitory activity and either total tissue sulfhydryl concentration or tricarboxylic acid soluble sulfhydryl concentration. 29 references. (Author abstract modified)

244513 Gessa, G. L.; Tagliamonte, A. Institute of Pharmacology, University of Cagliari, Italy **Effect of methadone and dextromoramide on dopamine metabolism: comparison with haloperidol and amphetamine.** *Neuropharmacology (Oxford)*. 14(12):913-920, 1975.

The effect of dextromoramide and methadone on the dopamine system was compared with that of haloperidol and amphetamines. The relationship between the catalepsy inducing potency of these narcotic analgesics and their potency in increasing dopamine (DA) turnover was further studied in mice. Results show that methadone interacted with the same receptors blocked by haloperidol, and that the blockade of haloperidol receptors is not the only mechanism by which methadone stimulates DA synthesis. The inhibitory effect of these compounds on DA sensitive adenylyl cyclase parallels their capacity to produce catalepsy and reflects their analgesic potency in rats. Changes in dihydroxyphenylacetic acid level,

without parallel changes in that of homovanillic acid, seem to reflect changes in DA uptake *in vivo*. It is concluded that the central nervous stimulation elicited by the analgesics cannot be related to an amphetamine like action on brain dopaminergic mechanisms. The site and nature of the action of analgesics on brain DA neurons needs further clarification. 23 references.

244514 Carenzi, A.; Cheney, D. L.; Costa, E.; Guidotti, A.; Racagni, G. Laboratory of Preclinical Pharmacology, NIMH, St. Elizabeths Hospital, Washington, DC 20032 Action of opiates, antipsychotics, amphetamine and apomorphine on dopamine receptors in rat striatum: *in vivo* changes of 3',5'-cyclic AMP content and acetylcholine turnover rate. *Neuropharmacology* (Oxford). 14(12):927-939, 1975.

The action of three classes of drugs on dopamine (DA) receptors in rat striatum was examined. Opiates were shown to increase DA turnover in striatum and nucleus accumbens similarly to antipsychotics and (+)-amphetamine, but the mechanisms involved were different in the three classes. Antipsychotics blocked DA activation of adenylyl cyclase *in vitro*, inhibited the decrease of striatal acetylcholine turnover rate elicited by apomorphine, and inhibited the increase of striatal cyclic adenosine monophosphate (cAMP) content elicited by (+)-amphetamine and apomorphine. Opiates did not appear to cause these three biochemical responses which indicate a blockade of DA receptors. Moreover, they appeared neither to release striatal DA *in vivo* as (+)-amphetamine did, nor to inhibit striatal cholinergic receptors as clozapine does. The actions exerted by the opiates on striatal DA synapses could be differentiated from those elicited by the antipsychotics, anticholinergics and (+)-amphetamine. 54 references.

244638 Roberge, A. G.; Parent, A.; Boulay, M. Lab. de Neurobiologie, Faculté de Médecine, Université Laval, Québec, Canada, G1K 7P4 Demonstration of an inversely proportional relationship between dopamine and serotonin in certain cerebral structures: neurochemical and morphological aspects. Demonstration d'une relation inversement proportionnelle entre la dopamine et la sérotonine dans certaines structures cérébrales: aspects neurochimique et morphologique. *Journal of Neurochemistry* (Oxford). 26(3):591-595, 1976.

Cats treated chronically with p-chlorophenylalanine (250mg/kg, i.p., 2 doses, 72 hours apart) demonstrate a significant decrease in serotonin concentrations in all structures within the brain. The noradrenaline level was not affected. Dopamine concentrations were, however, significantly increased in the piriform lobe, septum, hypothalamus and mesencephalon and unchanged in the neostriatum, frontal cortex, tuberculum olfactorium and cerebellum. In cats bearing a selective lesion of nucleus raphe dorsalis without involving other raphe nuclei, a significant decrease in serotonin was observed in the neostriatum and piriform lobe. Compared to p-chlorophenylalanine treated cats, lesioned cats show a significant increase in dopamine content in the piriform lobe but not in the neostriatum. A single dose of p-chlorophenylalanine (250mg/kg, i.p.) as well as a selective lesion of nucleus raphe central superior caused a significant decrease in serotonin level without affecting dopamine concentration. Such findings allow differentiation of a group of structures belonging to the limbic system from those of the extrapyramidal motor system on a biochemical as well as on a morphological basis. Moreover, these results suggest that dopamine in the nigrostriatal pathway has a different function from dopamine involved in the limbic system. 36 references. (Author abstract)

244651 Thomnse, Klaus; Jensen, Jørgen; Olesen, Ole Vendelin. Aarhus Univ. Psychiatric Inst., Psychopharmacology Research Unit, State Med. Hosp., 8240 Risskov, Denmark Effect of prolonged lithium ingestion on the response to mineralocorticoids in rats. *Journal of Pharmacology and Experimental Therapeutics*. 196(2):463-468, 1976.

The effect of long-term lithium administration on the response to mineralocorticoids was investigated in rats which were adrenalectomized in order to avoid the effects of endogenous hormone. The hormone response was estimated from the changes in urinary excretion of sodium and potassium in rats on low and high sodium intake and from the consumption of a hypertonic sodium chloride (NaCl) solution by rats given a free choice between this and demineralized water. Lithium was found to lower the response to aldosterone and deoxycorticosterone acetate both in acute and chronic experiments. It was further found that in adrenalectomized rats given no hormone, those given lithium consumed significantly more NaCl solution than those given no lithium. Results thus provide evidence that lithium induces a sodium requirement beyond that induced by the inhibition of the response to mineralocorticoids. 9 references. (Author abstract)

244678 Pugsley, T.; Lippmann, W. Biochemical Pharmacology Department, Ayerst Laboratories, 1025 Laurentien Blvd., P.O. Box 6115, Saint Laurent, Quebec, Canada Effects of tandamine and pirandamine, new potential antidepressants, on the brain uptake of norepinephrine and 5-hydroxytryptamine and related activities. *Psychopharmacology* (Berlin). 47(1):33-41, 1976.

Two novel agents, tandamine (TA, a thiopyrano (3,4-b) indole) and pirandamine (PA, an indeno (2,1-c) pyran), and the tricyclic antidepressants desimipramine (DMI), imipramine (I), and amitriptyline (A) were compared in various *in vivo* pharmacological tests and for norepinephrine (NE) and 5-hydroxytryptamine (5-HT) neuronal uptake inhibition. TA was found to be equivalent, or greater, in activity to DMI in blocking brain NE uptake, antagonizing reserpine induced effects and potentiating the behavioral effects of L-dopa. TA did not appreciably block brain 5-HT uptake, but did potentiate central 5-HT activity at high doses. PA exerted an opposite profile to TA, being equivalent to A and greater than I as a 5-HT uptake blocker and central 5-HT potentiator. Neither TA nor PA exhibited *in vivo* monoamine oxidase inhibition or central anticholinergic effects. It is concluded that TA is a relatively specific blocker of neuronal NE uptake and PA is a selective 5-HT uptake blocker. 51 references. (Author abstract modified)

244681 Erdmann, G.; Just, W. W.; Thel, S.; Werner, G.; Wiechmann, M. Pharmakologisches Institut der Universität, Frankfurter Str. 107, D-6300 Giessen, Germany Comparative autoradiographic and metabolic study of delta8- and delta9-tetrahydrocannabinol in the brain of the marmoset *Callithrix jacchus*. *Psychopharmacology* (Berlin). 47(1):53-58, 1976.

The label distribution in the brain of the marmoset *Callithrix jacchus* following intravenous application of radioactively labeled delta8-tetrahydrocannabinol (delta8-THC) and delta9-THC was investigated by autoradiographic technique. Accumulations of label were observed in nuclei concerned with motor function, in the optic and acoustic pathways, and a few other structures. Of the two hydroxylated isomers, which were shown to be equally psychoactive, the brain concentration of 11-OH-delta9-THC was found to be about three times higher compared with 11-OH-delta8-THC, which may explain why delta9-THC is more potent than delta8-THC. More than 90% of the radioactivity found in the brain was attributed to the

THCs and their 11-hydroxylated isomers. Polar metabolites were almost completely absent from the brain. 17 references. (Author abstract)

244688 Schnell, R. C.; Stoll, R. E.; Prosser, T. D. Merck, Sharp and Dohme Research Laboratories, West Point, PA 19486 **Barbital alteration of central nervous system sensitivity to hexobarbital in the rat.** *Psychopharmacology (Berlin)*. 47(1):93-96, 1976.

Alteration in central nervous system (CNS) sensitivity to the hypnotic effect of hexobarbital was assessed by analytical, electroencephalographic, and pharmacokinetic techniques in barbital treated rats. Each of these conceptually diverse experimental methodologies yielded similar conclusions concerning the alteration of CNS sensitivity by barbital treatment. 15 references. (Author abstract)

244691 Carmona, A.; Slangen, J. UCB, Pharmaceutical Division, Pharmacological Research Department, 68, rue Berken-dael, B-1060, Brussels, Belgium **Hypothalamic chemostimulation and autonomic changes in curarized rats.** *Psychopharmacology (Berlin)*. 47(1):105-110, 1976.

The inhibition of heart rate elicited by both adrenergic and cholinergic stimulation of the lateral hypothalamic area (LHA) was investigated in rats. Rats previously implanted with chronic double walled cannulae aimed at the LHA ate and drank reliably after minute injections of norepinephrine and carbachol respectively. Later on the rats were curarized and artificially respired. After a habituation period during which rectal temperature, cardiac rate, and peripheral vasomotor activity were continuously recorded, half of the Ss were injected with one microliter of norepinephrine and the other half with one microliter of carbachol. Both drugs elicited hypothermia, bradycardia and vasodilatation. Bradycardia after carbachol was significantly greater than after norepinephrine and hypothermia, and vasodilatation after norepinephrine was significantly greater than after carbachol. When the treatments were reversed, essentially the same effects were observed. 22 references. (Author abstract)

244692 Grundig, E.; Raheem, K. Abdel; Salvenmoser, F.; Schedl, R.; Weiss, J. Med.-Chem. Institut der Universität Wien, Währinger Strasse 10, A-1090 Vienna, Austria **Drug-induced parkinsonism in the rat -- a model for biochemical investigation of the Parkinson-Syndrome: III: The incorporation of D-glucose-14C(U) in amino acids of brain and liver from rats pretreated with reserpine or with phenothiazines.** *Psychopharmacology (Berlin)*. 47(1):111-118, 1976.

The incorporation of radioactive label into the brain and liver amino acids of rats with a parkinsonoid reaction provoked by the administration of either reserpine or a combination of phenothiazines was investigated. Concentration and radioactivities of glutamic acid, glutamine, serine, and glycine were assayed. After reserpine, the concentrations of serine and glycine were increased 10 fold while their specific activities decreased by the same factor. The interconversion of serine/glycine was not affected. The concentration of glutamic acid was reduced while its specific activity remained constant. After phenothiazines, the concentrations of serine and glycine in brain were also increased but their specific activities were decreased to a different degree. The interconversion of serine/glycine was also altered. The concentration of glutamic acid was decreased but specific activity was essentially constant. The influence of both treatments on amino acid turnover in liver differed from the observed impairment of brain metabolism. Possible correlations between the changes in

amino acid metabolism, catecholamines, and the neurological parkinsonian symptoms are discussed. 49 references. (Author abstract modified)

244693 Boyd, E. S.; Boyd, E. H.; Brown, L. E. Department of Pharmacology and Toxicology, University of Rochester Medical Center, Rochester, NY 14642 **Effects of delta9-tetrahydrocannabinol and pentobarbital on a cortical response evoked during conditioning.** *Psychopharmacology (Berlin)*. 47(1):119-122, 1976.

The concomitant effects of (-)-delta9-trans-tetrahydrocannabinol (delta9-THC) and of pentobarbital on behavior in the squirrel monkey and on the frontal cortical activity evoked by stimuli used to control that behavior are reported. A surface negative wave, evoked by tone cues, appeared in monkey postarcuate cortex as the monkey learned that the cue signaled the availability of reward. This evoked activity was depressed, concomitantly with changes in the animal's behavioral responding, by doses of delta9-THC as low as 0.032mg/kg and of pentobarbital as low as 4mg/kg. Pentobarbital tended to increase the latency of the evoked wave, an effect not seen with delta9-THC. 11 references. (Author abstract)

244725 Bach, Diana; Raz, Avraham; Goldman, Rachel. Lab. of Membranes and Bioregulation, Weizmann Institute of Science, Rehovot, Israel **The interaction of hashish compounds with planar lipid bilayer membranes (BLM).** *Biochemical Pharmacology (Oxford)*. 25(11):1241-1244, 1976.

The interaction of hashish compounds with phosphatidyl choline or phosphatidyl serine black lipid membranes was investigated. Results reveal that asymmetric distribution of cannabinoid across lecithin membranes generate as membrane potential and a decrease in electrical resistance of a transient nature. Symmetric distribution of the compounds resulted in the generation of membranes of low resistance in which no membrane potential or transient behavior of resistance could be observed. 14 references.

244740 Dormard, Y.; Levron, J. C.; Benakis, A. Isotope Laboratory, Dept. of Pharmacokinetics of the Research and Pharmacology Center Albert Rolland, Chilly-Mazarin, France **Pharmacokinetic study of maleate acid of 2-(N,N-dimethylaminoethanol-14C1)-cyclohexylpropionate (cyprodenate) and of N,N-dimethylaminoethanol-14C1 in animals: I. localisation, distribution, and elimination of 14C-cyprodenate and 14C-dimethylamino Arzneimittel-Forschung (Aulendorf)**. 25(2):194-201, 1975.

The localization, distribution, and elimination of maleate acid 2-(N,N-dimethylaminoethanol-14C1)-cyclohexylpropionate (14C-cyprodenate, Actebral) was studied in rats and pigs. Dimethylaminoethanol-14C (DMAE) was also administered to rats to compare the pharmacokinetics of the two 14C labelled molecules. The study of the localization by autoradiography and the study of the quantitative distribution of the radioactivity showed that cyprodenate, a psychotonic drug, diffused more rapidly than DMAE through the blood-brain barrier. The two labelled products were primarily excreted in the urine following oral administration of cyprodenate. Radioactivity expired as 14CO₂ was negligible. In rats and pigs the maximum radioactivity in the blood was found 1 h after oral administration of 14C-cyprodenate. These values decrease slowly until 3 h when they increase again. Whatever route of administration and whichever dose or animal, a progressive elevation of the protein binding to the plasma proteins for these two labelled products in vivo is evident. 18 references. (Journal abstract modified)

244741 Dormard, Y.; Levron, J. C.; Le Fur, J. M. Dept. of Pharmacokinetics, Research and Pharmacology Center Albert Rolland, 4, rue de la Division Leclerc, F-91 380 Chilly-Mazarin, France **Pharmacokinetic study of maleate acid of 2-(N,N-dimethylaminoethanol-14C1) cyclohexylpropionate (cyprodenate) and of N,N-dimethylaminoethanol-14C1 in animals: II. Study and identification of the metabolites of 14C-cyprodenate and 14C-dimethylaminoethanol-14C1 in animals.** *Arzneimittel-Forschung* (Aulendorf). 25(2):201-207, 1975.

The study of the biotransformation of 2-(N,N-dimethylaminoethanol) cyclohexylpropionate-maleate acid (cyprodenate, Actebral), a psychotonic brain stimulant, was carried out on two species of animals (rats and pigs) with the aid of 14C labelled molecules. Following i.v. administration in rats, it was found that 14C-cyprodenate diffuses very rapidly to the principal organs preceding a hydrolysis which gives 14C-dimethylaminoethanol (DMAE). The latter undergoes N-oxidation but the major portion of DMAE goes directly into the metabolic cycle of the phospholipids up to the formation of 14C-choline. Similar results were found with the oral administration of 14C-cyprodenate in pigs, thus showing a more intense participation of the product at the level of the intermediary metabolism of phospholipids, precursors of choline. 21 references. (Journal abstract modified)

244874 Belegaud, J.; Baron, J.-B.; Boudene, C.; Soullairac, A.; Truhaut, R. Laboratoire de Toxicologie, rue J.-B.-Clement, 92290 Chateaufort-Malabry, France **Pharmacological approaches to the function of certain nonspecific subcortical structures participating in the genesis of the visual evoked potential. Applications to the study of several psychotropics.** *Approches pharmacologiques du fonctionnement de certaines structures sous-corticales non spécifiques rentrant dans la genèse du potentiel évoqué visuel. Applications à l'étude de quelques substances psychotropes.* *Thérapie* (Paris). 30(1):103-116, 1975.

A method for investigating the effect of chemical substances on the function of nonspecific subcortical structures is described. Experiments were performed on the nonanesthetized rabbit using certain psychotropic substances. Variations in electroretinograph (ERG) and visual evoked potential (VEP) recordings permitted orienting the investigation of the action of certain molecules with respect to their adrenergic or cholinergic properties. The effects of the administration of a barbiturate show that there is a dissociation in the central response. It is hypothesized that subcortical structures controlled by catecholamines and acetylcholine play an identical role in the morphology of the VEP. It is also hypothesized that a decrease in latency time concretizes excitation of subcortical structures by ensuring the regulation of levels of central nervous system vigilance controlled by adrenaline and acetylcholine, given that the cortical excitation induced by caffeine remains without effect. 22 references.

245115 Vetulani, Jerzy; Sulser, Fridolin. Vanderbilt University School of Medicine, Nashville, TN 37232 **Action of various antidepressant treatments reduces reactivity of noradrenergic cyclic AMP-generating system in limbic forebrain.** *Nature*. 257(5526):495-496, 1975.

To determine whether antidepressant drugs which do not elevate the level of monoamines in the brain share the effect of monoamine oxidase (MAO) inhibitors on the noradrenergic cyclic AMP generating system, the effect of the tricyclic antidepressants desipramine and iprindole on the reactivity of the rat limbic forebrain system to noradrenaline (NA) was studied. The effect of electroconvulsive treatment (ECT) was also investigated. Findings indicate the dissociation of acute

biochemical effects of antidepressant drugs from their therapeutic action, which occurs only after chronic treatment for weeks. It is felt that the demonstrated decrease in noradrenergic receptor function as a consequence of various antidepressant treatments (pharmacotherapy and ECT) should direct future neurochemical research to focus on the elucidation of molecular mechanisms of altered aminergic receptor function, and provide a new theoretical framework for studies on both pathogenesis and therapy of affective disorders. 21 references.

245296 Lassen, J. Buus; Squires, R. F.; Christensen, J. A.; Molander, L. Dept. of Pharmacology, A/S Ferrosan, Sydmarken 1-5, DK-2860 Soeborg, Denmark **Neurochemical and pharmacological studies on a new 5HT-uptake inhibitor, FG4963, with potential antidepressant properties.** *Psychopharmacologia* (Berlin). 42(1):21-26, 1975.

A new phenylpiperidine derivative, FG4963, and several tricyclic antidepressants were compared in various in vitro and in vivo tests for central 5HT and NA uptake inhibition. FG4963 was found to be a 5HT pump blocker with activity similar to that of chlorimipramine. FG4963 inhibited NA uptake less than the most potent tricyclic thymoleptics. In contrast to imipramine derivatives, FG4963 was found to be a weak inhibitor of peripheral NA uptake. FG4963 seems to produce central 5HT potentiation without affecting organ functions regulated by the autonomic nervous system as much as tricyclic antidepressants. 47 references. (Author abstract)

245298 Gotestam, K. Gunnar; Lewander, Tommy. Psychiatric Research Center, University of Uppsala, Ulleraker Hospital S-750 17 Uppsala, Sweden **The duration of tolerance to the anorexic effect of amphetamine in rats.** *Psychopharmacologia* (Berlin). 42(1):41-45, 1975.

The duration of tolerance to the anorexic effect of amphetamine was studied in rats. Rats were given dl-amphetamine 16 mg/kg twice daily for 15 days. Complete tolerance to the anorexic effect of amphetamine developed from day 7 to 11. A single injection of 16 mg/kg amphetamine was given to the amphetamine pretreated rats and to saline pretreated controls at different time points after withdrawal, and their food intakes were compared. Signs of tolerance were present at 16 but not 20 days after withdrawal. Implications for dosimetry are considered. This study is believed to confirm earlier results of tolerance development. 12 references. (Author abstract modified)

245300 Watson, Eric; Wilk, Sherwin. Department of Pharmacology, Mount Sinai School of Medicine, City University of New York, New York, NY 10029 **Assessment of cerebrospinal fluid levels of dopamine metabolites by gas chromatography.** *Psychopharmacologia* (Berlin). 42(1):57-62, 1975.

A study was conducted to assess the levels of the dopamine (DA) metabolites, 3,4-dihydroxyphenylacetic acid (DOPAC) and homovanillic acid (HVA) in human cerebrospinal fluid (CSF) using a gas chromatographic procedure. After gas chromatographic separation, the pentafluoropropionyl 2,2,3,3,3-pentafluoro-1-propionyl esters of DOPAC and HVA were analyzed by electron capture detection. Normal HVA levels were quantitated in as little as 0.1ml CSF. No significant amounts of DOPAC were found in any of the drug free samples analyzed. Levels of DOPAC increased only marginally in the CSF of patients receiving acute or chronic doses of L-Dopa. Baseline HVA levels ranged from 4.5 to 50 ng/ml with a mean value of 23 ng/ml. These studies are considered to demonstrate that HVA is the major dopamine metabolite in human CSF. 23 references. (Author abstract modified)

245595 Nistri, A.; De Bellis, Angolia M.; Cammelli, Emanuela. Institute of Pharmacology, Faculty of Medicine, University of Florence, 50134 Florence, Italy Drug-induced changes in behaviour and ganglionic acetylcholine concentration of the leech. *Neuropharmacology* (Oxford). 14(8):565-569, 1975.

The effects of general anesthetics, stimulants and cholinergic drugs on behavior and nerve cord acetylcholine levels are investigated in the leech (*Hirudo medicinalis*) in vivo. Results show that anesthesia was produced by ethanol, ether or crushed ice, but was not associated with changes in ganglionic acetylcholine content. Leptazol induced convulsions were accompanied by a large decrease in the acetylcholine content. Eserine produced sustained muscular contractions and a marked rise in acetylcholine, which was not affected by scopolamine or oxotremorine. It is concluded that the sensitivity of leech acetylcholine containing cells to centrally acting drugs differs from that of mammalian brain neurones. 20 references. (Author abstract modified)

245597 Fukuda, T.; Araki, Y.; Suenage, N. Department of Pharmacology, Faculty of Medicine, Kyushu University, Fukuoka 812, Japan Inhibitory effects of 6-hydroxydopamine on the clonic convulsions induced by electroshock and decapitation. *Neuropharmacology* (Oxford). 14(8):579-483, 1975.

Effects of intraventricular injections of 6-hydroxydopamine (6-OHDA) on maximal electroshock seizures and decapitation convulsions are investigated in mice. The incidence of the clonic phase of maximal electroshock seizure was suppressed by 6-OHDA. The time course of suppression was felt to be in good agreement with the depressed level of whole brain norepinephrine. The incidence of clonic convulsions following decapitation was also suppressed by 6-OHDA. On the contrary, the tonic phase of maximal electroshock seizure was potentiated by the treatment. The incidence of the clonic phase of maximal electroshock seizure and decapitation convulsions were well correlated in 6-OHDA treated mice which had been exposed to maximal electroshock seizure and then decapitated. It is suggested that the central catecholaminergic mechanism concerned with the clonic phase in maximal electroshock seizure is analogous to that concerned with decapitation convulsions and different from that underlying the tonic phase of maximal electroshock seizure. 17 references. (Author abstract)

245598 Goodale, D. B.; Moore, K. E. Department of Pharmacology, Michigan State University, East Lansing, MI 48824 Benztropine-induced release of dopamine from brain in vivo. *Neuropharmacology* (Oxford). 14(8):585-589, 1975.

The effect of benztropine on brain dopamine is investigated in the cat. The addition of brief pulses of 10(-5)M benztropine to cerebrospinal fluid perfusing the cat cerebroventricular system was found to increase the efflux of (3H)-dopamine from the brain. The anticholinergic properties of benztropine do not appear to be involved in this response, since similar additions of 10(-4) M atropine or scopolamine did not markedly alter the efflux of (3H)-dopamine. Actual electrolytic lesions of the nigrostriatal pathway blocked the efflux of (3H)-dopamine produced by 10(-5) M benztropine. It is suggested that the releasing action of benztropine is dependent on the activity of neurones in the nigrostriatal pathway and that results are consistent with the proposal that benztropine blocks the reuptake of neurogenically released dopamine. 11 references. (Author abstract modified)

245599 Dzoljic, M. R.; Bonta, I. L.; Godschalk, M.; Lagendijk, A.; Stefanko, S. Department of Pharmacology, Medical

School, Erasmus University of Rotterdam, The Netherlands EEG-synchronizing effect of gamma hydroxybutyrate and 1-hydroxy-3-amino-pyrrolidone-2 (HA-966) in relation of dopaminergic brain function. *Neuropharmacology* (Oxford). 14(8):591-599, 1975.

Effects of gamma hydroxybutyrate and HA-966 on EEG synchronization are studied in the rat. The synchronization induced by alpha-methyl-p-tyrosine began earlier than the decrease of the duration of arousal, indicating different sensitivities to the depressive drug action of structures responsible for synchronizing and for arousal. HA-966 in diethylthio-carbamate desynchronized animals increased the amplitude but the duration of arousal was unchanged. p-Chlorophenylalanine treatment of rats did not influence the synchronizing effect of HA-966 or the inhibitory effect on duration of arousal. Haloperidol potentiated the synchronizing effect of gamma hydroxybutyrate and HA-966. The number of phasic discharges in the electrocorticogram induced by treatment with anesthetic doses of gamma hydroxybutyrate were increased by low doses of haloperidol, while higher doses were ineffective. Animals with intact and lesioned substantia nigra compact responded equally to the synchronizing activity of HA-966 and gamma hydroxybutyrate. It is concluded that their effect is not brought about by the accumulation of dopamine in the nigrostriatal system. 35 references. (Author abstract modified)

246145 Dafny, Nachum. Univ. of Texas Medical School, Texas Medical Ctr., Houston, TX 77025 Selective field potential changes induced by L-Dopa. *Experimental Neurology*. 49(1):189-202, 1975.

The effects of L-Dopa on certain neurological functions in rats are examined. Average acoustic evoked responses following paired stimuli were recorded simultaneously from the caudate nucleus, globus pallidus, substantia nigra, ventromedial hypothalamus, arcuate nucleus, anterior hypothalamus, and medial geniculate body in freely moving rats implanted with permanent electrodes. Click stimuli evoked large amplitude responses in all the structures under the present study. The neuronal recovery function measured by consecutive paired click stimuli separated by varying time intervals was found to differ among structures. Low doses (10mg/kg) of pentobarbital increased the average acoustic evoked response and shortened the neuronal recovery function, and higher dose of pentobarbital (40mg/kg) attenuated the average acoustic evoked responses in all seven structures. Differences in sensitivity to pentobarbital were observed between structures. L-Dopa administration increased the average acoustic evoked responses recorded from caudate nucleus, globus pallidus, substantia nigra, ventromedial hypothalamus, and arcuate nucleus, but did not affect the average acoustic evoked responses recorded from anterior hypothalamus and medial geniculate body. The neuronal recovery functions obtained from substantia nigra, anterior hypothalamus, and medial geniculate body were unaffected by L-Dopa or reserpine while in the other structures (caudate nucleus, globus pallidus, ventromedial hypothalamus, and arcuate nucleus), L-Dopa shortened the recovery time of the second response, and reserpine reversed this phenomenon only in caudate nucleus without modifying the L-Dopa effects in the other structures. The present observations indicate that there are marked differences in the physiological properties of the structures under investigation, and that there are direct relationships to the effects of L-Dopa and reserpine. Findings suggest two hypotheses: dopamine is not exclusively an inhibitory neurotransmitter, or the action of dopamine is to remove the inhibitory properties of the inhibitory interneurons. 24 references. (Author abstract modified)

246149 Hollister, A. S.; Ervin, G. N.; Cooper, B. R.; Breese, G. R. Biological Sciences Research Ctr., Child Development Inst., School of Medicine, Univ. of No. Carolina, Chapel Hill, NC 27514 The roles of monoamine neural systems in the anorexia induced by (+)-amphetamine and related compounds. *Neuropharmacology* (Oxford). 14(10):715-723, 1975.

The anorectic effects of (+)-amphetamine, mephentermine, methylphenidate, amantadine, or fenfluramine were examined in animals pretreated intracisternally with either 6-hydroxydopamine or 5,7-dihydroxytryptamine. Destruction of brain dopamine systems antagonized the anorectic effect of (+)-amphetamine and mephentermine, but did not block the anorectic effects of fenfluramine. Neither destruction of brain norepinephrine systems nor depletion of norepinephrine with the dopamine-beta-hydroxylase inhibitor, U-14,624, antagonized the anorectic response to (+)-amphetamine. While destruction of brain serotonin containing systems did not alter the anorectic response to (+)-amphetamine, it significantly enhanced the anorectic potency of fenfluramine. 29 references. (Author abstract)

246151 Sherman, A.; Gal, E. M.; Fuller, R. W.; Molloy, B. B. Psychiatry Dept., Univ. of Iowa College of Medicine, Iowa City, IA Effects of intraventricular p-chloroamphetamine and its analogues on cerebral 5-HT. *Neuropharmacology* (Oxford). 14(10):733-737, 1975.

A dose/response curve for serotonin (5-HT) depletion by intraventricularly administered p-chloroamphetamine was established along with its effect on the activity of tryptophan-5-hydroxylase. The effects of several analogues on cerebral 5-HT were assessed following their intraventricular administration. Changes in 5-HT were determined at various time intervals after administration of the analogues. The minimal intraventricular dose at which p-chloroamphetamine depressed 5-HT at 6 hr after injection was 200 micrograms. Of the agents tested, only chloroamphetamine reduced both 5-HT and 5-hydroxyindoleacetic acid at 6 hours. p-Fluoroamphetamine and fenfluramine, like p-chloroamphetamine, produced a long lasting depression of cerebral 5-HT levels. Intraventricularly injected p-chloroamphetamine reduced activity of tryptophan-5-hydroxylase with and without iprindole pretreatment, but had little effect on catecholamine levels. The results are considered compatible with the previous hypothesis that p-chloroamphetamine is converted to some metabolite responsible for the long-term neurotoxic effects. 14 references. (Author abstract)

246152 Rastogi, R. B.; Singhal, R. L.; Hrdina, P. D. Pharmacology Dept., Univ. of Ottawa, Ottawa, Canada K1N 9A9 Influence of desmethylimipramine on some neurochemical alterations during experimental hypothyroidism. *Neuropharmacology* (Oxford). 14(10):747-753, 1975.

The effect of the antidepressant desmethylimipramine on brain metabolism, and the modification of the neurochemical effects of methimazole by alterations in receptor sensitivity, were investigated in hypothyroid rats. Chemical thyroidectomy induced by administration of methimazole in neonatal rats reduced the activity of brain tyrosine hydroxylase and tryptophan hydroxylase as well as the levels of norepinephrine, dopamine and 5-hydroxytryptamine. However, the concentration of 5-hydroxyindoleacetic acid was markedly elevated. Whereas brain acetylcholine levels remained unaltered, the activity of its catabolizing enzyme, acetylcholinesterase, was significantly lowered by methimazole. Acute treatment with desmethylimipramine (10 mg/kg, i.p.) suppressed the activity of tryptophan hydroxylase and the levels of 5-hydroxytryptamine

and 5-hydroxyindoleacetic acid in both normal and hypothyroid rats. However, this tricyclic antidepressant failed to exert any appreciable effect on the amounts of norepinephrine, dopamine or acetylcholine in either group of animals. The data suggest that the responsiveness of the critical receptors at presynaptic and/or postsynaptic sites to the action of desmethylimipramine remains unaltered in hypothyroid rats. Furthermore, a possibility exists that the disturbed balance between central dopaminergic and cholinergic mechanisms might, at least in part, be associated with the aberrant behavior and impaired psychomotor activity seen in the cretinoid state. 45 references. (Author abstract modified)

246286 O'Leary, Marion H.; Baughn, Richard L. Department of Chemistry, University of Wisconsin, Madison, WI 53706 New pathway for metabolism of dopa. *Nature* (London). 253(5486):52-53, 1975.

The metabolism of L-dopa (3,4-dihydroxyphenylalanine), used in the treatment of Parkinsonism, was studied in order to elucidate the mechanism of its action in relation to its effects. In vitro evidence was found for a minor pathway of dopa metabolism resulting in the formation of 3,4-dihydroxyphenylacetaldehyde (DHPA) with concomitant inactivation of dopa decarboxylase. The abortive transamination of dopa by dopa decarboxylase was characterized by the demonstration of DHPA, inactivation of the enzyme in the absence of free pyridoxamine 5-phosphate (PLP) at a rate commensurate with the amount of DHPA formed and the ability of PLP to reactivate the enzyme at least partially. The fractional turnover leading to transamination together with decarboxylation was small, but measurable. 14 references.

246311 Key, B. J. Pharmacology Dept., Medical School, Univ. of Birmingham, B15 2TJ, England Effect of chlorpromazine on the interaction between phasic and tonic electrocortical arousal mechanisms. *Psychopharmacologia* (Berlin). 44(2):179-185, 1975.

The effect of chlorpromazine on the rate of habituation of phasic arousal responses was studied in cats carrying permanently implanted cortical recording electrodes. In the sleeping animal repeated presentation of an auditory stimulus (1 sec duration, 3000 Hz) at intensities which only produced a localized, phasic electrocortical change in the auditory cortex, resulted in the rapid habituation of this latter response. Once habituation had occurred, the intensity of the stimulus was increased until a similar change in electrocortical activity once again appeared in the auditory cortex. The habituation procedure was then repeated. In this way it was possible to habituate the animal gradually to successively higher intensities of auditory stimulation without ever inducing behavioral arousal or tonic, generalized changes in electrocortical activity. It was possible to reach a level of stimulation which previously would have induced overt behavioral effects and tonic arousal. It is felt that alterations in the activity of the mechanisms responsible for phasic electrocortical responses leads to changes in the responsiveness of the animal even during sleep. Following chlorpromazine phasic electrocortical responses were still elicited but their rate of habituation was significantly increased. Thus the overall effect of chlorpromazine is considered to be a marked shortening in the time taken to train the sleeping animal not to respond behaviorally or with tonic electrocortical changes to a particular auditory stimulus. 39 references. (Author abstract)

246316 Schaeffer, James C.; Cho, Arthur K.; Nagami, Glenn T.; Takimoto, Glenn S. Pharmacology Dept., Center for the

Health Sciences, Univ. of California at Los Angeles, Los Angeles, CA 90024 Inhibition of synaptosomal accumulation of l-norepinephrine I: N-arylalkyl and N-aryloxyalkyl diamphetamines and related compounds. *Journal of Pharmaceutical Sciences*. 64(9):1462-1469, 1975.

The ability of a group of systematically modified amphetamines to inhibit the accumulation of l-norepinephrine by nonstriatal synaptosomes is investigated. N-Substitution by the proper bulky hydrophobic groups was tolerated. Structure activity relationships generate a qualitative picture of the inhibitor carrier interaction site. 27 references. (Journal abstract)

246319 Sari, Atsuo; Fukuda, Yasuo; Sakabe, Takefumi; Mackawa, Tsuyoshi; Ishikawa, Toshizo. Dept. of Anesthesiology, Yamaguchi Univ., School of Medicine, 1144 Kogushi Ube, Yamaguchi, Japan Effects of psychotropic drugs on canine cerebral metabolism and circulation related to EEG -- diazepam, clomipramine, and chlorpromazine. *Journal of Neurology, Neurosurgery and Psychiatry* (London). 38(9):838-844, 1975.

The effects of diazepam, clomipramine, and chlorpromazine upon cerebral metabolism and blood flow are examined separately in 18 dogs. After the administration of diazepam or clomipramine, cerebral cortical oxygen consumption (CMR) decreased significantly by a maximum of 17% and 13% of control within 10 minutes and 15 minutes, and returned to control at 120 minutes and 90 minutes, respectively. Chlorpromazine, however, decreased by a maximum of 10% of control, a level which continued throughout the period of observation. It was observed that reduction in CMR glucose was followed by the reduction in CMR oxygen at an interval during the early stages of CMR oxygen depression. Diazepam produced a significant decrease in cerebral blood flow (CBF) accompanied by a reduction in CMR oxygen, but neither clomipramine nor chlorpromazine had any effect on CBF in spite of reduction in CMR oxygen. Reduction in CMR oxygen both with diazepam and clomipramine was accompanied by slow wave activities of EEG, but with chlorpromazine reduction in CMR oxygen was accompanied with less pronounced slow wave activities. It is concluded that the three drugs examined are cerebral metabolic depressants. 24 references. (Author abstract)

246389 Dinnendahl, V.; Stock, K. Institut für Pharmakologie, Medizinische Hochschule D-3 Hannover 61, Karl-Wiechert-Allee 9, West Germany Effects of arecoline and cholinesterase inhibitors on cyclic guanosine 3',5'-monophosphate and adenosine 3',5'-monophosphate in mouse brain. *Archives of Pharmacology* (Berlin). 290(2-3):297-306, 1975.

A study was conducted with mice to determine whether the central initiation of Arecoline is mediated by changes in the brain of the cyclic adenosine cAMP, or cyclic guanosine cGMP. Results show that Arecoline in vivo dosedependently increased the cGMP concentrations of the cerebellum and the cerebrum without influencing the cAMP levels. The cholinesterase inhibitors paraoxon and physostigmine caused an elevation only in cerebrum, whereas the cGMP content of the cerebellum even decreased. Pretreatment with atropine was found to prevent the rise in cGMP levels as well as the symptoms of cholinergic stimulation elicited by arecoline or paraoxon. Diazepam reduced cGMP levels below control values and blocked the effect of arecoline, while typical symptoms due to arecoline, (tremor and salivation) remained unaffected. The tripeptide prolyl-leucyl-glycinamide (MIF) had no effect on either cGMP values or the peripheral signs of cholinergic stimulation elicited by arecoline. The results show that elevation of cGMP in the central nervous system caused

by cholinomimetic agents can be prevented not only by cholinolytics, blocking muscarinic receptors but also by influencing other mechanisms. 21 references. (Author abstract modified)

246586 LaBella, Frank S.; Vivian, Stanley. Dept. of Pharmacology and Therapeutics, University of Manitoba, Faculty of Medicine, Winnipeg, Manitoba, Canada Effect of B-aminopropionitrile or prednisolone on survival of male LAF/J mice. *Experimental Gerontology* (Oxford). 10(3-4):185-188, 1975.

The effects of B-aminopropionitrile (BAPN) and prednisolone, added to the drinking water at 1mg/ml and 2 microg/ml, respectively, on survival of 2-month-old male LAF/J mice were investigated. In one experiment BAPN, prednisolone, or both were administered throughout the entire lifespan, with no significant differences from control in either mean lifespan, 28 to 29 months, or maximum lifespan, 33 to 35 months. In a second experiment, BAPN was administered for 0, 3, 6, 9 or 12 months only. Median lifespan of 26 months for control animals was significantly increased for 3 of the 4 test groups, the animals treated with BAPN for 12 months showing the greatest increase, i.e., median 31 months. Maximum lifespan of control animals was 33 months, and was 1 to 3 months longer for BAPN treated groups. Results suggest that lifelong treatment with BAPN has no salutary influence on survival of mice in contrast to those animals receiving the drug during an early portion of the lifespan. 5 references. (Author abstract modified)

246587 Spoceri, P. E.; Glees, P. Inst. of Histology and Neuroanatomy, Univ. of Gottingen, Germany The mode of lipofuscin removal from hypothalamic neurons. *Experimental Gerontology* (Oxford). 10(3-4):225-228, 1975.

Lipofuscin accumulation and its removal by chemical interference in neurons of the anterior hypothalamus of senile guinea pigs was investigated. Centrophenoxine (80mg/kg bodyweight) was administered i.m. to senile guinea pigs for 30 to 90 days. The effects of cessation of drug administration for up to 80 days was studied in one group of animals. Electron microscopic examination of the anterior hypothalamus of the control senile animals showed considerable accumulation of pigment. Drug administration for longer than 70 days caused dissolution and removal of the pigment by phagocytic cells. Numerous osmiophilic granules were found in the capillary endothelium. Pigment elimination continued for a considerable period after stopping drug administration. It is concluded that the massive pigment removal caused by centrophenoxine is based on a mechanism normally present and found in regions where the drug performs its major physiological mechanisms. 22 references. (Author abstract modified)

246661 Simon, Marcia; George, Robert; Garcia, Joseph. Department of Pharmacology and Brain Research Institute, University of Calif., Los Angeles, CA 90024 Acute morphine effects on regional brain amines, growth hormone and corticosterone. *European Journal of Pharmacology* (Amsterdam). 34(1):21-26, 1975.

In an investigation of the influence of morphine brain amine transmitters and anterior pituitary hormone release, morphine sulfate was injected in doses of 5, 10 and 20mg/kg i.p. to male rats at 3:00 pm. At 4:00 pm, the rats were decapitated and norepinephrine, dopamine and serotonin levels were measured in seven brain regions (cortex, striatum, septum, amygdala, hypothalamus, midbrain and pons). Growth hormone and corticosterone levels were assayed from plasma. Saline injected

animals served as controls. The only significant change in brain amine level was an increase in striatal dopamine which occurred after 5mg/kg morphine. Twenty mg/kg caused an increase in plasma corticosterone; lower doses were ineffective. The dose for maximum growth hormone release was 10mg/kg, although all three doses were effective. It was not possible to relate changes in brain amine levels with these hormonal responses to acute morphine administration. 33 references. (Author abstract modified)

246662 Simon, Marcia; George, Robert; Garcia, Joseph. Dept. of Pharmacology and Brain Research Institutes, University of Calif., Los Angeles, CA 90024 **Chronic morphine effects on regional brain amines, growth hormone and corticosterone.** *European Journal of Pharmacology (Amsterdam)*. 34(1):27-38, 1975.

An examination of the relationship between regional levels of brain amines (norepinephrine, NE; dopamine, DA; serotonin, 5-HT) and plasma hormone levels (corticosterone, CS; growth hormone, GH) in rats following chronic morphine administration (40 mg/kg twice daily) is presented. Amine and hormone levels were determined after 1, 2 and 6 weeks of daily injections of morphine. Increased plasma CS was found after 1 and 2 weeks of injections and decreased GH levels were present after 2 and 6 weeks. In another 2 week study when morphine was administered 1hr before sacrifice, plasma levels of CS were decreased and GH increased. Serotonin levels were decreased in all brain regions after 2 and 6 weeks of morphine administration and DA was decreased in the amygdala after 6 weeks. In 2 weeks treated rats injected 1hr before sacrifice 5-HT levels had returned to control levels and DA was decreased. Inverse correlations were found to relate with 5-HT and CS with CS levels and GH with brain DA. A direct correlation was present in GH and 5-HT levels. It is concluded that endocrine and brain amine effects of chronic morphine administration are highly dependent on duration and time of treatment, and that while tolerance develops to CS release and to endocrine organ (except adrenal) changes, tolerance does not occur to the DA, 5-HT or GH effects. 35 references. (Author abstract modified)

246665 Raiteri, Maurizio; Bertollini, Alberto; Angelini, Francesco; Levi, Giulio. Istituto di Farmacologia, Università Cattolica, Via Pineta Sacchetti 644, Roma, Italy **d-amphetamine as a releaser or reuptake inhibitor of biogenic amines in synaptosomes.** *European Journal of Pharmacology (Amsterdam)*. 34(1):189-195, 1975.

The effect of d-amphetamine on the release of tritiated norepinephrine (NE), dopamine (DA) and 5-hydroxytryptamine (5-HT) was analyzed in synaptosomes from different brain areas. 3H-NE release was unaffected in the hypothalamus, a region which is rich in noradrenergic terminals and in cerebellum and pons-medulla, but was substantially increased in corpus striatum and moderately in cerebral cortex. 3H-DA release was strongly enhanced in corpus striatum, a region rich in dopaminergic terminals, substantially increased in cerebral cortex, and slightly increased in the hypothalamus. Since the regional pattern of d-amphetamine stimulated release was similar with the two catecholamines, but the stimulation was greater with 3H-DA than with 3H-NE, and was more evident in areas richer in dopaminergic terminals, it is suggested that the drug can release 3H-DA or artificially stored 3H-NE from dopaminergic terminals, but not 3H-NE, from noradrenergic terminals. The d-amphetamine also seems capable of releasing 3H-5-HT from serotonergic terminals. In contrast with the two catecholamines, 3H-5-HT release was more enhanced in

cerebral cortex than in corpus striatum. 27 references. (Author abstract)

246671 Burki, H. R.; Eichenberger, E.; Sayers, A. C.; White, T. G. Research Institute, Wander Ltd., P.O. Box 2747, CH-3001 Berne, Switzerland **Clozapine and the dopamine hypothesis of schizophrenia, a critical appraisal.** *Pharmakopsychiatrie Neuro-Psychopharmakologie (Stuttgart)*. 8(3):115-121, 1975.

The results of a number of animal experiments with clozapine are discussed, with particular attention given to those pharmacological and neurochemical properties which distinguish clozapine from the classical neuroleptics. The question as to whether or not clozapine blocks DA receptors is felt to be a crucial point in regard to the dopamine hypothesis of schizophrenia, which proposes a direct relationship between antipsychotic effect and DA receptor blockade. Neurochemical, neuropharmacological, and endocrinological evidence is presented which casts doubt upon a DA receptor blockade by clozapine in pharmacologically relevant doses. It is concluded that these findings are difficult to reconcile with the dopamine hypothesis, and that the possibility of involvement of other transmitter systems should be investigated. 48 references. (Journal abstract modified)

246673 Smith, D. F.; de Jong, W. Research Unit, Statshospitalet, DK-8240 Risskov, Denmark **Renal lithium, sodium, potassium, and water excretion and plasma renin activity in rats in the cold.** *Pharmakopsychiatrie Neuro-Psychopharmakologie (Stuttgart)*. 8(3):132-135, 1975.

The effect of cold exposure on the plasma renin activity of 12 lithium treated rats was investigated as a step toward controlling serum lithium levels in psychiatric patients. A rise in urine volume and in the urinary excretion of lithium and sodium, but not of potassium, was observed in rats exposed to a cold environmental temperature (4 degrees C) for 3hrs. The level of plasma renin activity after the clearance test was found to be correlated to the urine volume, but not to the electrolyte composition in the urine. The results suggest that renal lithium clearance might be elevated in humans during exposure to cold, and that exposure to cold might thus be a factor that could influence the serum lithium level in psychiatric patients treated with lithium. 21 references. (Journal abstract modified)

246774 Franklin, K. B. J.; Herberg, L. J. Institute of Neurology, Queen Square, London WC1N 3BG, Great Britain **Self-stimulation and noradrenaline: evidence that inhibition of synthesis abolishes responding only if the "reserve" pool is dispersed first.** *Brain Research (Amsterdam)*. 97(1):127-132, 1975.

Role of noradrenaline (NA) in electrical self-stimulation is studied in rats trained to self-stimulate through steel electrodes in the lateral hypothalamic median forebrain bundle, or in the locus coeruleus. Although NA is supposed to play a critical part in electrical self-stimulation, suppression of NA synthesis by injection of the dopamine-beta-hydroxylase inhibitor, FLA-63 (Hassle AG)(25 mg/kg) had little or no effect on response rates. But 3 to 5 days after prior treatment with reserpine, FLA-63 in the same dosage suppressed or depressed self-stimulation without eliciting signs of general incapacity. Suppression of self-stimulation could be reversed by intraventricular injection of NA, indicating that the depressant effect depended specifically on NA depletion. It is suggested that NA may play a necessary role in self-stimulation and that the NA available for this purpose includes intraneuronal NA in a reserpine sensitive reserve pool. 24 references. (Author abstract modified)

246817 Shah, Nandkumar S.; Gulati, O. D. Ensor Research Laboratory, William S. Hall Psychiatric Institute, P. O. Box 119, Columbia, SC 29202 Studies on accumulation of (14C)-mescaline in brain homogenates: effects of psychotropic and other agents. *Pharmacology (Basel)*. 13(4):273-280, 1975.

An investigation of the effects of various psychotropic drugs, some catecholamines, indoleamines, and a few nucleotides on the accumulation of mescaline in the rat brain homogenate is reported. Incubation of rat brain homogenates of 14,500g pellet isolated from the homogenate with (14C)-mescaline was associated with accumulation of (14C)-mescaline in the pellet. It was found that 1.33micromol/ml of chlorpromazine, trifluoperazine, fluphenazine, imipramine, desmethylinipramine, nortriptyline and amitriptyline inhibited the accumulation of mescaline. Lower concentrations (0.133 to 0.44 micromol/ml) of the psychotropic drugs were less effective. The tricyclic antidepressants were less potent than the tranquilizers. Although the trimethoxyphenylacetic acid (TPMA) levels of the pellet were also reduced by the psychotropic drugs, the TPMA:mescaline ratios were unchanged indicating that the drugs had no effect on the metabolism of mescaline. It is suggested that the inhibition of accumulation of mescaline by the high concentrations of tranquilizers diverts more of the hallucinogen to the receptor site. Thus, an explanation for the reported worsening of clinical syndrome of hallucinogenic poisoning by tranquilizers is provided. 16 references. (Author abstract modified)

246822 Sivaramakrishna, N.; Gulati, O. D. Dept. of Pharmacology, Medical College, Baroda, India Accumulation of norepinephrine (NE) by rat organs in vivo. *Pharmacology (Basel)*. 13(4):365-377, 1975.

A study investigating the accumulation in the heart, the spleen and the lung of norepinephrine (NE) infused intravenously in large doses in normal rats and in rats subjected to various treatments in vivo is presented. It was found that in anesthetized rats infused, intravenously NE was accumulated by the heart, the spleen and the lung in a dose related manner. With the lower dose of NE (2.5mg/kg) the organ/blood ratios were more than unity and were generally greater than with higher doses (5 and 10 mg/kg) which was interpreted as indicating that accumulation occurred by active uptake. Nialamide and pyrogallol treatment increased accumulation in the three organs. In animals receiving nialamide and pyrogallol treatment, normetanephrine and desmethylinipramine inhibited accumulation in all the organs and the entire accumulation of NE could be ascribed to uptake-1, and uptake-2, processes. In these animals, phenoxybenzamine and bilateral adrenalectomy inhibited and enhanced, respectively the accumulation in the heart and the spleen only. NE accumulated in hearts of animals in vivo would be partly washed out by perfusion with NE-free medium in vitro. Washout was prevented by normetanephrine, indicating that this effect was not a passive diffusional leakage. 37 references. (Author abstract modified)

246842 Lefever, G. S.; Green, R. D. Dept. of Pharmacology, Univ. of Illinois at the Medical Center, Chicago, IL 60680 The effects of chronic ganglion blockade and chronic cholinesterase inhibition on the sensitivity of rabbit stomach muscularis to cholinergic and adrenergic agonists. *Journal of Pharmacology and Experimental Therapeutics*. 193(3):739-747, 1975.

The EC50 values, Ka (dissociation constant of agonists) values and efficacies (E) of selected agonists are determined in strips of stomach muscularis from control, chlorisondamine pretreated and 0,0-diethyl S(2(ethylthio)ethyl)phosphodithiote (disulfoton) pretreated rabbits. Results indicate that strips from

chlorisondamine pretreated animals are supersensitive to carbachol but normosensitive to phenylephrine; the E but not the Ka of carbachol is affected by this treatment. The Kb (dissociation constant of antagonists) of atropine is unchanged. Strips from animals treated with disulfoton are subsensitive to phenylephrine but normosensitive to amidephrine and carbachol. The Kb of phentolamine remains unchanged. Results indicate that the chlorisondamine induced supersensitivity is the result of a change beyond the level of the cholinergic receptors. In contradistinction, the subsensitivity to phenylephrine after disulfoton pretreatment may result, at least in part, from a qualitative change in the alpha adrenergic receptors in the stomach muscularis. 23 references. (Author abstract)

246843 Reid, John L.; Kopin, Irwin J. Dept. of Clinical Pharmacology, Royal Postgraduate Medical School, London, England The effects of ganglionic blockade, reserpine and vinblastine on plasma catecholamines and dopamine-beta-hydroxylase in the rat. *Journal of Pharmacology and Experimental Therapeutics*. 193(3):748-756, 1975.

The effects of ganglionic blockade, reserpine, and vinblastine on plasma catecholamines and dopamine-beta-hydroxylase (DBH) in the rat is presented. Results show that chronic ganglionic blockade induced by repeated doses of chlorisondamine rapidly lowers plasma norepinephrine, but plasma DBH activity, even after 5 days of treatment, is not significantly reduced. Long-term chlorisondamine treatment does not alter cardiac DBH or rapid axonal transport of DBH in the sciatic nerve. Chronic reserpine treatment increases plasma DBH after 2 and 5 days, whereas vinblastine causes a progressive fall in enzyme activity in plasma over the same time period. It is concluded that plasma DBH activity does not closely parallel adrenergic function and neurotransmitter release in the rat. The level of DBH appears to reflect the rate of enzyme synthesis and axonal transport. 37 references. (Author abstract modified)

246844 Cubeddu X. L.; Weiner, N. Universidad Central de Venezuela, Departamento de Farmacologia y Toxicologia, Apartado 40109, Nueva Granada, Caracas, Venezuela Release of norepinephrine and dopamine-beta-hydroxylase by nerve stimulation. V. enhanced release associated with a granular effect of a benzoquinolizine derivative with reserpine-like properties. *Journal of Pharmacology and Experimental Therapeutics*. 193(3):757-774, 1975.

Possible relationships between a granular effect and a facilitation in the release of transmitter and vesicular proteins by nerve stimulation are examined in cats. Results indicate that a reserpine like agent, 2-hydroxy-2-ethyl-3-isobutyl-9,10-dimethoxy-1,2,3,4,6,7-hexahydro-11b-benzo(a)quinolizine (BQZ), at concentrations that do not inhibit phosphodiesterase activity, produces a marked increase in the outflow of 3H-dihydroxyphenylethyleneglycol from the isolated perfused cat spleen prelabeled with 3H-norepinephrine (3H-NE). Results also suggest that in the presence of BQZ, a large fraction of the NE released during nerve stimulation is recaptured into the nerve terminals where it is subsequently metabolized to 3H-dihydroxyphenylethyleneglycol. Results provide an explanation for the accelerated depletion of tissue NE in animals treated with reserpine like compounds when the sympathetic innervation is intact. 64 references. (Author abstract modified)

246845 Reis, Donald J.; Joh, Tong H.; Ross, Robert A. Dept. of Neurology, Cornell University, Medical College, 1300 York Ave., New York, NY 10021 Effects of reserpine on activities

and amounts of tyrosine hydroxylase and dopamine-beta-hydroxylase in catecholamine neuronal systems in rat brain. *Journal of Pharmacology and Experimental Therapeutics*. 193(3):775-784, 1975.

Whether the reserpine elicited effect of tyrosine hydroxylase (TH) activity in the locus ceruleus is due to an accumulation of specific enzyme protein or to the activation of existing enzyme molecules, and if the effect is paralleled by changes in the regional activity and amount of dopamine-beta-hydroxylase (DBH) and in the activity of dopa decarboxylase (DDC), is investigated in rat brain. It is shown that reserpine increases the activities of the enzymes TH and DBH (but not DDC) 2 to 3 fold in the nucleus locus ceruleus of rat brain. The TH response is dose dependent, reaches a maximum in 48 hours, and recovers in three weeks. Reserpine increases the accumulation of TH, primarily in the cell bodies and to a far lesser degree in the terminals of neurons of locus ceruleus but not in dopaminergic neurons of the nigrostriatal system. The time course of enzyme accumulation parallels that of depletion of monoamines in the brain. 34 references. (Author abstract modified)

246846 Gallagher, Dorothy W.; Aghajanian, George K. Dept. of Psychiatry, Yale University School of Medicine, CMHC, 34 Park St., New Haven, CT 06508 **Effects of chlorimipramine and lysergic acid diethylamide on efflux of precursor-formed 3H-serotonin: correlations with serotonergic impulse flow.** *Journal of Pharmacology and Experimental Therapeutics*. 193(3):785-795, 1975.

The effects of d-lysergic acid diethylamide (LSD) and chlorimipramine (CIMI) on the firing rate of serotonergic (5-HT) neurons and on the in vivo efflux of 5-HT are investigated in parallel in rats. A cerebroventricular perfusing technique is used to measure the efflux of 3H-5-HT formed in vivo from 3H-tryptophan. It is concluded that: 1) LSD decreases 3H-5-HT efflux by directly inhibiting impulse flow in 5-HT neurons and/or by a local effect on 5-HT terminals; and 2) a low dose of CIMI produces no net change in 3H-5-HT efflux because a reduction in impulse flow dependent 5-HT release compensates for blockade by CIMI of 5-HT reuptake. 61 references. (Author abstract modified)

246847 Fuller, Ray W.; Perry, Kenneth W.; Molloy, Bryan B. Lilly Research Laboratories, Eli Lilly and Co., Indianapolis, IN 46206 **Effect of 3-(p-trifluoromethylphenoxy)-N-methyl-3-phenylpropylamine on the depletion of brain serotonin by 4-chloroamphetamine.** *Journal of Pharmacology and Experimental Therapeutics*. 193(3):796-803, 1975.

The effects of 3-(p-Trifluoromethylphenoxy)-N-methyl-3-phenylpropylamine (Lilly 110140) in the experimental paradigm are studied and results reported. When 110140 is injected into rats at i.p. doses of 1 to 10mg/kg, it prevents the lowering of brain serotonin by 4-chloroamphetamine. The duration of 110140 action is very long, significant antagonism of 4-chloroamphetamine action being still apparent at 48 hours after a single dose of 10mg/kg of 110140. Lilly 110140 does not antagonize the depletion of brain serotonin or norepinephrine by reserpine, which implies that reserpine does not require the membrane pump for entry into the neuron. In contrast to chlorimipramine, 110140 does not antagonize the depletion of norepinephrine levels in heart and spleen by 6-hydroxydopamine. Data suggest that 110140 is a specific drug for inhibiting uptake into serotonergic neurons in the brain. 21 references. (Author abstract modified)

246848 Wong, David T.; Bymaster, Frank P.; Horng, Jong S.; Molloy, Bryan B. Lilly Research Lab., Eli Lilly and Company, Indianapolis, IN 46206 **A new selective inhibitor for uptake of serotonin into synaptosomes of rat brain: 3-(p-trifluoromethylphenoxy)-N-methyl-3-phenylpropylamine.** *Journal of Pharmacology and Experimental Therapeutics*. 193(3):804-811, 1975.

The in vitro and in vivo properties of a new compound, 3-(p-trifluoromethylphenoxy)-N-methyl-propylamine (Lilly 110140) are described. It is indicated that 110140 competitively inhibits the uptake of serotonin (5-HT), norepinephrine (NE), and dopamine into synaptosomes of rat brain with certain Ki values. A more effective inhibitor of 5-HT uptake, it is found that the trifluoromethyl group in the phenoxy ring is most favorable at the para position and is better than other substituting groups, including fluoro, chloro, methyl, and methoxy groups. The N-demethylated (primary amine) and the N,N-dimethylated (tertiary amine) derivatives inhibit the uptake of monoamines with the same effectiveness as 110140. The uptake of 5-HT into synaptosomes is significantly inhibited 15 minutes after an intraperitoneal administration of 110140. Unlike the tricyclic drugs (imipramine, chlorimipramine, desipramine and chlordesipramine), 110140 and its primary amine derivative do not block the in vivo uptake of NE into the rat heart. It is concluded that 110140 is a potent and selective inhibitor for uptake of 5-HT into synaptosomes of rat brain. 22 references. (Author abstract modified)

246849 Knapp, Suzanne; Mandell, Arnold J. Dept. of Psychiatry, Univ. of South Dakota, P.O. Box 109, La Jolla, CA 92037 **Effects of lithium chloride on parameters of biosynthetic capacity for 5-hydroxytryptamine in rat brain.** *Journal of Pharmacology and Experimental Therapeutics*. 193(3):812-823, 1975.

The effects of lithium chloride on parameters of biosynthetic capacity for 5-hydroxytryptamine in rat brain are reported. Administration of lithium chloride to rats results in a biphasic temporally related alteration in the brain's biosynthetic capacity for 5-hydroxytryptamine (5-HT). After 3 to 5 days of drug administration, the Vmax of the high affinity uptake of tryptophan into striate nerve ending synaptosomes increased to 140% of control values. The sequence of events observed after lithium treatment is considered consistent with receptor mediated neuronal feedback regulation of tryptophan hydroxylase activity after stimulation of tryptophan uptake and conversion to 5-HT. 32 references. (Author abstract modified)

246850 Carmichael, F. J.; Israel, Y. Dept. of Pharmacology, Univ. of Toronto, Toronto, Ontario, Canada, M5S 1A8 **Effects of ethanol on neurotransmitter release by rat brain cortical slices.** *Journal of Pharmacology and Experimental Therapeutics*. 193(3):824-834, 1975.

Using a double label technique to preload rat brain cortex slices with different radioactive neurotransmitters, the effects of ethanol on the electrically stimulated release of these neurotransmitters are reported. It is shown that ethanol inhibits the release of these transmitters, acetylcholine being the most sensitive and occurring at concentrations compatible with moderate to severe intoxication in the rat. Two higher alcohols and two barbiturates are also shown to have a greater inhibitory effect on the stimulated release of acetylcholine than of norepinephrine. The effect of tetrodotoxin and of ouabain on neurotransmitter release is also reported. A comparison of the effects of these two drugs with those of ethanol suggests that the effect of ethanol is consistent with an inhibition of the ac-

tion potential by this drug, although it is indicated that the specific effect of ethanol on the excitation coupling process at the synapse cannot be discarded. 53 references. (Author abstract modified)

246851 Sekerke, H. Joseph; Smith, Howard E.; Bushing, Jan A.; Sanders-Bush, Elaine. Dept. of Pharmacology and Chemistry, Vanderbilt University, Nashville, TN 37203 **Correlation between brain levels and biochemical effects on the optical isomers of p-chloroamphetamine.** *Journal of Pharmacology and Experimental Therapeutics*. 193(3):835-844, 1975.

The biochemical effects of d- and l-p-chloroamphetamine (PCA) are compared with the brain levels of the unchanged drug at various times after a single injection in rats. It is shown that initially both isomers produce rapid and pronounced decreases in the whole brain levels of serotonin and 5-hydroxyindoleacetic acid, tryptophan hydroxylase activity, and the synaptosomal uptake of 3H-serotonin. At later times, the effects of the d-isomer are much more pronounced than those of the l-isomer. It is concluded that the initial and long-term effects of PCA are apparently mediated by different mechanisms. The former is correlated with the brain levels of the unchanged drug; the latter is not. The lack of any indication of a biphasic decay curve after ten half lives and the intermediate recovery of serotonergic function do not support a reserpine like mechanism for the long-term effects of PCA. Instead, a mechanism related to neurotoxicity is proposed. 25 references. (Author abstract modified)

246968 Hoffman, D. J.; Chun, A. H. C. Pharmaceutical Products Div., Abbott Laboratories, North Chicago, IL 60064 **GLC determination of plasma drug levels after oral administration of clorazepate potassium salts.** *Journal of Pharmaceutical Sciences*. 64(10):1668-1671, 1975.

Plasma nordiazepam levels resulting from the oral administration of clorazepate potassium salts were determined by a sensitive GLC assay. Nordiazepam and the internal standard (diazepam) were selectively extracted into ether at pH 9.2, hydrolyzed to their respective benzophenones, and quantified by electron capture detection. The assay was used in a comparative bioavailability study of single equimolar oral doses of monopotassium and dipotassium salts of clorazepate in dogs. Both clorazepate salts were rapidly absorbed and exhibited mean peak total drug levels after 1 hour. Clorazepate levels accounted for about 50% of the total drug levels present. No statistical difference in the plasma drug levels of clorazepate monopotassium and dipotassium salts and the metabolite was found in dogs. 9 references. (Author abstract)

246971 Hasegawa, Mamoru; Takai, Haruki; Matsubara, Isao. Tokyo Research Laboratory, Kyowa Hakko Kogyo Co., Ltd. 3-6-6, Asahi-Cho, Machida-shi, Tokyo, Japan **Metabolic fate of flurazepam II: a new potent metabolite obtained by in vitro liver drug-metabolizing enzyme system.** *Journal of Pharmaceutical Sciences*. 64(10):1732-1733, 1975.

The central nervous system (CNS) depressant activity in DDY strain mice, the chemical structure, mass spectra profile, and the proton NMR spectra profile of a new potent metabolite of flurazepam are described in a letter to the editor. The new metabolite (termed V, as it is the predominate metabolite of IV) was found by using an in vitro liver drug metabolizing enzyme system. The CNS depressant activity is reported as being at the 50mg/kg dose level (oral), which is approximately the same potency as unchanged I. 3 references.

246996 Snyder, Solomon H. Department of Pharmacology and Experimental Therapeutics, Johns Hopkins Univ. School of Medicine, Baltimore, MD 21205 **Opiate receptor in normal and drug altered brain function.** *Nature (London)*. 257(5523):185-189, 1975.

The role of the opiate receptor site in normal and altered brain functioning is discussed, and an experiment that maps opiate receptors sites by means of autoradiography is reported. Recent biochemical identification of the receptor site for pharmacological actions of opiates is used to elucidate how these drugs relieve pain and elicit euphoria and addiction. The site identification is expected to direct future development of potentially nonaddictive analgesics. The isolation of a morphinelike peptide which may be a central nervous system neurotransmitter is described; this peptide is related to normal brain mechanisms regulating pain and emotion. It is suggested that changes in the adenylate cyclase associated with the opiate receptor itself may explain many of the mechanisms of addiction. 57 references. (Author abstract modified)

246998 Myers, Paul R.; Livengood, David R.; Shain, William. Department of Neurobiology, Armed Forces Radiobiology Research Institute, Defense Nuclear Agency, Bethesda, MD 20014 **Effect of morphine on a depolarizing dopamine response.** *Nature (London)*. 257(5523):238-240, 1975.

In a letter to the editor, a study of the effects of morphine on dopamine response of the somatic cell hybrid 108CC-15 is reported in which dopamine was applied iontophoretically, and a depolarizing response was noted in 64% of the cells. Repeated application at close time intervals resulted in desensitization of the response. The response could be blocked by catecholamine antagonists. Implications of results are discussed in terms of the actions of morphine at the cellular level. 22 references.

247012 Benzi, Gianni. Pharmacology Dept., Univ. of Pavia, 27100 Pavia, Italy **An analysis of the drugs acting on cerebral energy metabolism.** *Japanese Journal of Pharmacology (Kyoto)*. 25(3):251-261, 1975.

The behavior of the redox potential of the lactate/pyruvate system and the changes of the redox potential of the lactate/pyruvate system across the brain, and the energy charge potential of the adenylate pool, are studied in the brain of curarized beagle dogs. The influence of certain drugs (amobarbital, nicergoline, theophylline, papaverine, bumethan, dipyrindamole, bemegride) on these parameters was evaluated under control conditions, during hypoxemia and during posthypoxemic recovery. On the whole, the action on energetic metabolism appeared to be unrelated to the action believed to be exerted by drugs on cerebral vessels. 24 references. (Author abstract)

247013 Iwata, Heitaroh; Okamoto, Hiroshi; Koh, Setsuko. Pharmacology Dept., Faculty of Pharmaceutical Sciences, Osaka Univ., Toyonaka, Toyonaka, Osaka, Japan **Effects of various drugs on serum free and total tryptophan levels and brain tryptophan metabolism in rats.** *Japanese Journal of Pharmacology (Kyoto)*. 25(3):303-310, 1975.

Various drugs known to bind to serum albumin were examined to determine whether or not they influenced the level of free tryptophan in rat serum in vitro and in vivo. Possible relationships between the serum free tryptophan level and serotonin (5-HT) synthesis in the brain and the hypothermic effects of these drugs were investigated. Of the drugs examined, sodium salicylate, sodium benzoate and indomethacin

caused a significant increase in the concentration of serum free tryptophan and stimulated the synthesis of 5-HT in the brain. Hypothermia induced by salicylate and indomethacin was potentiated by pretreatment with pargyline, a monoamine oxidase inhibitor. Administration of benzoate did not cause any change in body temperature, but after pargyline a hypothermia did occur. However, pretreatment with parachlorophenylalanine, an inhibitor of 5-HT synthesis, did not influence the hypothermia induced by salicylate and indomethacin. Relationship between the hypothermic effect and the increase of 5-HT synthesis in the brain after a large dose of salicylate and indomethacin is discussed. 16 references. (Author abstract)

247020 Williams, Carvell H.; Lawson, Jill. Dept. of Mental Health, Queen's Univ. of Belfast, 97 Lisburn Rd., Belfast BT9 7BL, Northern Ireland **Monoamine oxidase -- III: further studies of inhibition by propargylamines.** *Biochemical Pharmacology* (Oxford). 24(20):1889-1891, 1975.

The pKa values and partition coefficients are determined for a number of propargylamines. It is shown that in a number of cases there is a close correlation between the partition coefficient and the effectiveness of inhibition of mitochondrial monoamine oxidase as measured by I50 values. Using 14C-labelled pargyline and clorgyline it is shown that, in vitro, these substances fail to bind to proteins other than MAO, and that a number of other irreversible inhibitors prevent pargyline from binding to this enzyme. 17 references. (Author abstract)

247021 Halaris, Angelos E.; Belendiuk, Krystyna T.; Freedman, Daniel X. Department of Psychiatry, University of Chicago, Chicago, IL 60637 **Antidepressant drugs affect dopamine uptake.** *Biochemical Pharmacology* (Oxford). 24(20):1896-1898, 1975.

An attempt was made to detect whether or not inhibition of dopamine uptake is a common property of a number of antidepressants. In a study using in vitro rat brain, all drugs inhibited the uptake of 3H-dopamine by rat brain nuclei free homogenates, but the drugs were not equipotent as inhibitors of such uptake. The finding that chlorimipramine, a known potent blocker of serotonin uptake, was also a potent inhibitor of dopamine uptake was somewhat surprising. When compared to the stimulants, antidepressants as a group appeared weaker in inhibiting 3H-dopamine uptake. It is indicated that extension of these findings to the clinical state is prevented by insufficient present knowledge of drug levels in discrete brain regions after pretreatment in vivo; the findings suggest, however, that the inhibition of dopamine uptake by the antidepressants may be of physiological significance. 19 references.

247028 Roizen, Michael F.; Thoa, Nguyen B.; Moss, Jonathan; Kopin, Irwin J. Laboratory of Clinical Science, NIMH, Bethesda, MD 20014 **Inhibition by cyclopropane of release of norepinephrine, but not of dopamine-beta-hydroxylase from guinea pig vas deferens (unpublished paper).** Bethesda, Laboratory of Clinical Science, NIMH, 1975. 11 p.

Previous studies showing that halothane diminished nerve stimulation induced release of norepinephrine without diminishing release of dopamine-beta hydroxylase (DBH) are extended to show a direct inhibition by cyclopropane of veratridine induced release of norepinephrine but not of DBH. Using isolated guinea pig vas deferens, it was found that aeration with 10, 17.5 or 20% cyclopropane strikingly decreased veratridine induced norepinephrine release. Although cyclopropane depressed release of norepinephrine, it did not alter the amount of DBH released. The mechanism of this dis-

sociation between transmitter and enzyme release is discussed. Since the effect of cyclopropane on sympathetic neuronal discharge cannot account for the maintenance of cardiovascular function during cyclopropane anesthesia, it is suggested that the maintenance of blood pressure under cyclopropane anesthesia may be attributed to a balancing of sympathetic neuronal depression by direct vascular smooth muscle stimulation. 15 references.

247032 Mezey, Esteban; Potter, James J.; Brandes, David. Dept. of Medicine, Baltimore City Hospitals, Baltimore, MD 21224 **Effects of a choline-deficient diet on the induction of drug- and ethanol-metabolizing enzymes and on the alteration of rates of ethanol degradation by ethanol and phenobarbital.** *Biochemical Pharmacology* (Oxford). 24(21):1975-1981, 1975.

An investigation of the biochemical effects of a choline deficient diet in rats is studied to determine the effect in vivo of alterations of liver phospholipids on the activity of microsomal enzymes on parameters of ethanol metabolism, and on the adaptive responses of both to ethanol and phenobarbital administration. Choline deficiency resulted in an increase in total liver lipids and triglycerides, but in a decrease in total phospholipids, due mostly to a decrease in phosphatidylcholine. Choline deficiency did not result in changes in microsomal enzymes or parameters of ethanol metabolism. However, it did prevent optimal induction of aniline hydroxylase activity and cytochrome P-450, by both ethanol and phenobarbital, and of microsomal protein concentration and cytochrome b5 by phenobarbital; it also prevented ethanol induced increases both in the activity of the microsomal ethanol oxidizing system and in the rates of ethanol disappearance from the blood. Alcohol dehydrogenase activity remained unchanged. It is concluded that this study demonstrates that dietary choline is required for optimal induction of microsomal enzymes by both ethanol and phenobarbital, and for increases in ethanol metabolism induced by ethanol administration. It is suggested that a decrease in available hepatic phosphatidylcholine, due to choline deficiency, is a cause of inhibition of the optimal induction of microsomal enzymes. 56 references. (Author abstract modified)

247039 Kamei, Chiaki; Masuda, Yoshinobu; Oka, Makoto; Shimizu, Masanao. Department of Pharmacology, Research Laboratories, Daiinippon Pharmaceutical Co., Ltd., Suita-shi, Osaka, Japan **Effects of antidepressant drugs on amygdaloid after-discharge in rats.** *Japanese Journal of Pharmacology* (Kyoto). 25(4):359-366, 1975.

Effects of antidepressant drugs on the amygdaloid after-discharge induced by stimulating the amygdala in rats implanted with chronic electrodes, were investigated in correlation with antimuricidal effects as well as neurotoxicity. It was found that tricyclic antidepressants such as amitriptyline, imipramine and nortriptyline markedly depressed both after-discharge and muricide at doses smaller than neurotoxic doses. The effect of PF-257 (1,2-benzisoxazole-3-acetimidoxime hydrochloride) was also the same as tricyclic antidepressants. On the other hand, methamphetamine and piperidol blocked the muricide at doses smaller than neurotoxic doses without depressing the amygdaloid afterdischarge. Major tranquilizers, chlorpromazine and clozapine depressed both afterdischarge and muricide only at doses larger than those which impaired rotarod performance. Haloperidol, on the contrary, depressed the afterdischarge without selectively blocking the muricide. Minor tranquilizers, diazepam and chlorodiazepoxide, did not block the muricide at doses smaller than neurotoxic doses,

although they showed a marked depression of the after-discharge. 14 references. (Author abstract modified)

247129 Bickel, M. H. Medizinisch-chemisches Institut, University of Berne, Berne, Switzerland Binding of chlorpromazine and imipramine to red cells, albumin, lipoproteins and other blood components. *Journal of Pharmacy and Pharmacology* (London). 27(10):733-738, 1975.

The binding of model drugs to human blood and individual blood components was determined by equilibrium dialysis and expressed in terms of binding sites, association constants, and binding capacities. Chlorpromazine and imipramine were found to be bound to three major components: membranes of red cells, albumin, and lipoproteins. The affinity and capacity of lipoprotein binding is considered at least as high as that of albumin and is equally distributed on lipoprotein fractions (HDL, LDL, and VLDL) and on the chylomicrons. White blood cells and platelets are felt to be of minor importance in terms of binding capacity. No binding was detected with gamma-globulins, alpha-globulins, and beta-globulins other than lipoproteins. In contrast, salicylic acid was not bound to red cells or lipoproteins. It is concluded that the binding of certain classes of drugs to red cells and lipoproteins may be of equal or greater importance than their binding to serum albumin. 27 references. (Author abstract modified)

247130 Dreyfuss, J.; Ross, J. J., Jr.; Shaw, J. M.; Miller, I.; Schreiber, E. C. Departments of Drug Metabolism and Pharmacology, Squibb Institute for Medical Research, New Brunswick, NJ 08903 Depot fluphenazine enanthate and decanoate: comparative rates of release in dogs. *Journal of Pharmacy and Pharmacology* (London). 27(10):791-792, 1975.

The comparative rate of release for fluphenazine enanthate and fluphenazine decanoate in experimental dogs is investigated. Both esters, containing a certain amount of radioactivity, were injected intramuscularly into the biceps femoris of dogs. Samples of blood were taken periodically for 35 days; total urine and feces were collected separately each day. The times required to attain maximum concentrations of total radioactivity in plasma were 3.8 plus or minus 0.5 days for enanthate and 10.6 plus or minus 1.1 days for decanoate. Lines of best fit for the total excretion of radioactivity after dosing with each ester, as determined by analysis of linear regression, indicated that the half-time for the release of radioactivity from the depot and body was 5.55 days for enanthate and 15.4 days for decanoate. It is concluded that decanoate was released from its site of injection as a depot at less than one half of the rate of enanthate, although the metabolic studies using experimental dogs measured undifferentiated radioactivity. 9 references.

247131 Riva, E.; Hrdina, P. D.; Morselli, P. L. Istituto di Ricerche Farmacologiche 'Mario Negri', Milan, Italy Measurement of desipramine in brain tissue by a radioisotope derivative technique. *Journal of Pharmacy and Pharmacology* (London). 27(10):797-799, 1975.

A radioisotope derivative technique was used to measure low quantities of desipramine in brain tissues of experimental rats. The determination of desipramine in brain tissues involved an initial basic extraction of the drug with heptane, followed by an acid back extraction with heptane and by a final basic extraction with hexane. For simultaneous estimation of desipramine concentrations in brain and plasma, Wistar rats were injected with a dose of the drug and killed 15 or 60 min later. Plots of radioactivity recovered from samples of water, plasma, or brain homogenate against the concentration of

desipramine added to these samples showed that radioactivity was proportional to the amount of drug added to the brain homogenate, plasma, or water in a specified concentration range. The brain tissue to plasma ratio of drug increased from 5 to 8 at 15 min to 25 to 2 at 60 min after administration of a single dose, indicating that the tricyclic antidepressant rapidly leaves the blood and is accumulated in the brain. 8 references.

247146 Racagni, G.; Trabucchi, M.; Cheney, D. L. Laboratory of Preclinical Pharmacology, National Institute of Mental Health, St. Elizabeths Hospital, Washington, DC 20032 Steady-state concentrations of choline and acetylcholine in rat brain parts during a constant rate infusion of deuterated choline. *Nauyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 290(1):99-105, 1975.

A study was conducted to determine whether the intravenous injection of choline alters the choline or acetylcholine content in various regions of the rat brain. Results show that an intravenous infusion of deuterated choline at constant rate for 6 min significantly increases the concentration of choline in plasma, occipital cortex and striatum. Both 5 and 25 micromoles kg⁻¹ min⁻¹ increase the concentration of acetylcholine in cortex but only 25 micromoles kg⁻¹ min⁻¹ increases the acetylcholine content in striatum. In contrast, 1 micromole kg⁻¹ min⁻¹ does not change the choline or acetylcholine content in cortex or striatum. A single pulse injection of choline causes a significant increase in the concentration of choline in striatum 30 sec following injection. The choline content returns to normal values within 2 min. Results indicate that when a pulse injection of a nontracer dose of radioactive choline is used to measure brain acetylcholine turnover rate the maintenance of steady state must be verified within seconds after the pulse injection of radioactive choline. When constant infusion of deuterated choline is used to measure turnover rate of acetylcholine in the brain of rats, a dose of 1 micromole kg⁻¹ min⁻¹ appears to be a maximal infusion rate. 17 references. (Author abstract modified)

247208 Marchand, A.; Wagner, B. M.; Fenoglio, C. M.; Cooper, T. B.; and Kline, N. S. Research Center, Rockland Psychiatric Center, Orangeburg, NY Studies on the mechanism of lithium action: preliminary report. *Psychopharmacology Communications*. 1(2):139-156, 1975.

The findings of a series of observations utilizing the scanning electron microscope (SEM) on the choroid plexus of rats treated with lithium are reported. Seven male rats, Wistar strain, were used for the study. The five experimental rats received 100 ppm LiCl daily, and the two controls received 100 ppm NaCl. All seven animals were sacrificed after 13 weeks and their choroid plexi were identified and prepared for the SEM. It was found that chronic lithium treatment produces significant changes in the microvillous processes on the cell surface of the choroid plexus. It is suggested that these alterations may be associated with increased intracellular choroidal volume. It is hypothesized that these changes represent an alteration in movement of water into the extracellular areas of the brain. It is felt that this lithium induced basic alteration in the secretory absorptive capacity of the choroid plexus is probably reversible. 12 references.

247211 Bunney, B. S.; Walters, J. R.; Kuhar, M. J.; Roth, R. H.; Aghajanian, G. K. Yale University School of Medicine, 34 Park Street, New Haven, CT 06508 D & L amphetamine stereoisomers: comparative potencies in affecting the firing of central dopaminergic and noradrenergic neurons. *Psychopharmacology Communications*. 1(2):177-190, 1975.

An experiment investigating the effect of the d-isomers and l-isomers of amphetamine on the activity of dopaminergic neurons in the substantia nigra zona compacta and the activity of noradrenergic neurons in the locus is reported. Anesthetized and gallamine paralyzed rats were used for the study. It was found that d-amphetamines and l-amphetamines administered intravenously were equally effective in depressing the activity of locus coeruleus cells. However, it was also found that although d-amphetamine was a potent inhibitor of substantia nigra dopamine containing cells, l-amphetamine was ineffective in causing more than a 45% inhibition in these cells. In the remaining dopamine neurons, l-amphetamine was found to be only 0.2 to 0.05 times as potent as d-amphetamine in producing both 50% and 100% inhibition of firing rate. It is concluded that low doses of l-amphetamine have a preferential effect on noradrenergic neurons as compared to dopaminergic neurons. The findings' implications for determining the catecholamine system responsible for a particular behavior in man and animals are discussed. 37 references. (Author abstract modified)

247212 Brounagh, R. L.; Goldstein, M. Dept. of Psychiatry, Neurochemistry Laboratories, New York Univ. Medical Center, 550 First Avenue, New York, NY 10016 The effect of various chlorpromazine derivatives on the apomorphine-elicited inhibition of synaptosomal tyrosine hydroxylase activity. *Psychopharmacology Communications*. 1(2):201-208, 1975.

The effects of chlorpromazine and some of its metabolites on the apomorphine elicited inhibition of synaptosomal tyrosine hydroxylase were investigated. It was discovered that chlorpromazine, norl-chlorpromazine and 7-hydroxychlorpromazine reverse the apomorphine elicited inhibition of tyrosine hydroxylase activity while norl-chlorpromazine sulfoxide and nor2-chlorpromazine sulfoxide have no effect on this inhibition. It was also discovered that 6-hydroxychlorpromazine and promethazine reverse the enzyme inhibition by apomorphine but are less potent than chlorpromazine or 7-hydroxychlorpromazine. It is concluded that chlorpromazine and its metabolites with antipsychotic activity are more effective in reversing the apomorphine elicited inhibition of tyrosine hydroxylase than those metabolites which are devoid of antipsychotic activity. 11 references. (Author abstract modified)

247213 Bourgoin, S.; Hery, F.; Ternaux, J. P.; Hamon, M. Groupe NB, Inserm U.114, College de France 11, place Marcelin Berthelot, 75005 Paris, France Effects of benzodiazepines on the binding of tryptophan in serum. consequences on 5-hydroxyindoles concentrations in the rat brain. *Psychopharmacology Communications*. 1(2):209-216, 1975.

A series of experiments which demonstrate that benzodiazepines (diazepam, oxazepam, and chlorthalidoxepoxide) can modify the binding of tryptophan to serum albumin are reported. Results indicate that in vivo treatment with any of these compounds will induce a significant increase in the concentration of free tryptophan in serum. It is suggested that the high levels of both 5-hydroxyindoles and tryptophan which occurred in the rat brain after the various benzodiazepine injections could be partly the consequence of its effect on tryptophan binding in blood. 10 references. (Author abstract modified)

247215 Rotrosen, John; Friedman, Eitan; Gershon, Samuel. Dept. of Psychiatry, New York Univ. Medical Center, 550 First Avenue, New York, NY 10016 The search for the dopamine receptor: tribulations. *Psychopharmacology Communications*. 1(2):229-237, 1975.

An experiment was performed in an attempt to identify specific binding to dopamine receptors, the binding of 3H-pimozide to preparations of the brain and to an artificial cellulose membrane. It was found that binding occurred rapidly, was pH and temperature dependent, and was displaceable by other neuroleptics. It was observed that a weak correlation exists between IC50's for displaced binding of drugs and their clinical potencies, and that displaceable binding of 3H-pimozide in different brain areas did not correlate with dopamine levels. It is suggested that the similarity of binding properties to the brain and to an artificial membrane is a function of the physical/chemical properties of these drugs, and that these properties may be related to their clinical effect. 10 references. (Author abstract modified)

247513 Nicoll, Roger A. Department of Pharmacology and Physiology, University of California, San Francisco, CA 94143 Pentobarbital: action on frog motoneurons. *Brain Research* (Amsterdam). 96(1):119-123, 1975.

The effect of barbiturates on frog motoneurons was studied by means of sucrose gap recording to determine whether barbiturates had a differential action on the postsynaptic action of the inhibitory and excitatory transmitter. All the barbiturates tested, including thiopental, amylobarbitol and barbital, had a hyperpolarizing action on frog motoneurons. Barbituric acid, however, had no effect on the membrane potential of motoneurons. It was found that gamma-aminobutyric acid (GABA) antagonists picrotoxin and bicuculline, but not the glycine antagonist strychnine, reversibly block the hyperpolarizing response to pentobarbital. The effect of pentobarbital on the action of putative excitatory and inhibitory transmitters was also analyzed. It is concluded that the depression of putative excitatory transmitter action by pentobarbital confirms previous studies and would be expected to contribute to the depression of excitatory synaptic transmission, while the pentobarbital induced enhancement of the GABA hyperpolarization could contribute to the augmentation of synaptic inhibition. 36 references.

247514 Cohn, Major L.; Cohn, Marthe; Taylor, Floyd H. Dept. of Anesthesiology, Magee-Womens Hospital, Univ. of Pittsburgh School of Medicine, Pittsburgh, PA 15213 Thyrotropin releasing factor (TRF) regulation of rotation in the non-lesioned rat. *Brain Research* (Amsterdam). 96(1):134-137, 1975.

Thyrotropin releasing factor (TRF) regulation of rotation was studied in the nonlesioned rat by pretreating with either apomorphine or reserpine, both known to alter dopamine activity in the striatum. It was found that (+)-amphetamine and TRF produced rotational behavior in the nonlesioned rat. The rotation was specific to the drug used in pretreatment: apomorphine caused clockwise rotation while reserpine caused counterclockwise rotation. It is suggested that the similar results produced by both drugs indicate that the hypothalamic factor acts as an indirect dopamine releaser at the anatomically well defined nigrostriatal dopamine pathway. This is supported by the finding that in pretreated rats (+)-amphetamine or TRF induced rotations were inhibited by prior administration of haloperidol, a well known dopaminergic inhibitor. It is concluded that these results link, for the first time, a hypothalamic hormone to a neurotransmitter system. 11 references.

247588 Holinka, C. F.; Nelson, J. F.; Finch, C. E. Andrus Gerontology Ctr., U.S.C., Los Angeles, CA 90007 Effect of estrogen treatment on estradiol binding capacity in uteri of aging rats. *Gerontologist*. 15(5):30, 1975.

In a paper given at the 28th meeting of the Gerontological Society, October 1975, in Louisville, Kentucky, a significant loss in the senescent rat uterus of 17 beta estradiol (E2) binding, a potential mediator of uterine changes, and an increase in receptor levels to mature values in E2 treated senescent rats are reported. Uteri of mature (M, 7 mo.) and senescent (S, 27 mo.) Holtzman rats were homogenized in 0.01 M Tris-0.0015M EDTA-0.02% Na azide buffer and centrifuged (143,000g x 76 min.). Specific binding in cytosol incubated with 3H-E2 (1hr at 0°C) was determined by charcoal absorption. Mean binding plus or minus SE, expressed as 10-15 moles E2 bound/ug DNA in M and S rats, OVX 48 to 72hr earlier, was 1.50 plus or minus 0.36 and 0.14 plus or minus 0.01 respectively. When rats were injected sc with E2 (12 ug E2/100 gm BW daily for 7 to 11 days, starting 1 day after OVX), E2 binding 72hr after last treatment was 1.22 plus or minus 0.18 (M) and 0.84 plus or minus 0.16 (S). Data suggest that loss of uterine E2 binding capacity during aging is at least in part hormonally regulated and raise the possibility that age related, hormonally dependent uterine changes may not be irreversible. (Author abstract modified)

247730 Patel, B. C.; Crosset, P.; Klawans, Harold L. Division of Neurology, Michael Reese Hospital and Medical Center, 2929 South Ellis Avenue, Chicago, IL **Failure of increased brain gamma-aminobutyric acid levels to influence amphetamine-induced stereotyped behavior.** Research Communications in Chemical Pathology and Pharmacology. 12(4):635-643, 1975.

An investigation of the effect of increased brain gamma-aminobutyric acid (GABA) levels on amphetamine induced stereotyped behavior in guinea pigs is reported. It was found that increased brain (GABA) levels secondary to the administration of sodium valproate failed to inhibit amphetamine induced stereotyped behavior. This observation raises some doubt as to whether GABA plays a role in the physiology of the striatum and suggests that GABA does not play a role in the pathophysiology of chorea. It is noted that, if this is true, pharmacologic attempts to increase brain GABA may not improve human choreatic disorders. 18 references. (Author abstract modified)

247731 Turner, D. M. Dept. of Biochemistry and Drug Metabolism, Hazelton Laboratories, Europe Ltd., Harrogate, Yorkshire, England **The role of adrenal catecholamines in the release of corticosterone and fatty acids by nicotine in the rat.** Research Communications in Chemical Pathology and Pharmacology. 12(4):645-655, 1975.

The role of adrenal catecholamines in the release of corticosterone and fatty acids by nicotine was investigated in the rat. It was found that subcutaneous injection of 0.4mg/kg nicotine caused an increase in the plasma levels of corticosterone and free fatty acids. It is noted that similar rises have occurred when the same animals were stressed by placing them on an elevated platform. Bilateral adrenal demedullation abolished the response of both corticosterone and free fatty acids to nicotine. Stress, however, still resulted in a significant elevation of plasma corticosterone whereas fatty acid levels were only marginally affected. It is suggested that the principal effect of nicotine is mediated via adrenal release of catecholamines and that centrally mediated stimulation is not significant. 20 references. (Author abstract modified)

247777 Avni, J.; Gerson, S.; Draskoczy, P. R.; Schildkraut, J. J. Neuropsychopharmacology Laboratory, Massachusetts Mental Health Center Dept. of Psychiatry, Harvard Medical

School, Boston, MA 02115 **Norepinephrine content of various rat organs after chronic administration of desmethylimipramine.** Archives Internationales de Pharmacodynamie et de Therapie (Ghent). 218(1):106-109, 1975.

The effect of chronic oral administration of desmethylimipramine (DMI) on the norepinephrine (NE) content of various organs was examined in rats. Results show that in contrast to its effect on the brain, where it lowered the NE concentration, chronically administered DMI either did not change (vas deferens) or tended to increase (heart and spleen) the NE concentrations in the examined peripheral organs. The effect of chronic DMI administration on the brain seems to be specific since this was the only studied organ in which a decreased NE concentration was observed. 11 references. (Author abstract)

247847 Manowitz, Paul; Shull, Christine M. Psychiatry Department, C.M.D.N.J.--Rutgers Medical School, Piscataway, NJ 08854 **Methaqualone metabolism by rat liver microsomes.** Research Communications in Chemical Pathology and Pharmacology. 13(1):27-39, 1976.

A rat hepatic microsomal system was established which metabolizes methaqualone. The microsomes were obtained from livers of rats treated with phenobarbital. The methaqualone was dissolved in polyethylene glycol-200 prior to addition to the incubation mixture. A comparison was made between the metabolites obtained in this *in vitro* system and metabolites obtained from urines of phenobarbital treated rats injected with methaqualone. The same two and sometimes three metabolites, as determined by thin layer and gas liquid chromatography, were found in both the complete microsomal incubation system and the urines. 15 references. (Author abstract)

247862 Creese, Ian; Burt, David R.; Snyder, Solomon H. Dept. of Pharmacology and Experimental Therapeutics, Johns Hopkins Univ. School of Medicine, Baltimore, MD 21205 **The dopamine receptor: differential binding of d-LSD and related agents to agonist and antagonist states.** Life Sciences (Oxford). 17(11):1715-1719, 1975.

In an investigation of the influence of LSD and related agents on specific dopamine receptor binding, binding in calf striatal membranes of 3H-dopamine and 3H-haloperidol was found to differentiate agonist and antagonist states of the receptor. Agonists and antagonists demonstrated selective affinities for dopamine and haloperidol sites respectively. In evaluating relative affinities for dopamine and haloperidol binding sites, it was observed that d-LSD interacts with considerable affinity at the dopamine receptor. Its similar competition for binding of the two tritiated ligands suggests that it is a mixed agonist/antagonist, an assumption consistent with its interactions with the dopamine sensitive adenylate cyclase. The effects of LSD on dopamine receptor binding were observed to be stereospecific, with d-LSD being 1,000 times more potent than LSD. 2-Bromo-LSD had more of an antagonist profile than d-LSD for the dopamine receptor. In binding experiments methiothepin behaved like a potent and relatively pure antagonist at dopamine receptors. Predictions that differential affinities of drugs for dopamine and haloperidol binding sites will characterize pure agonists, pure antagonists, and mixed agonist/antagonists are considered confirmed; it is concluded that the specific binding, of 3H-dopamine and 3H-haloperidol to calf striatal membranes provides a simple, sensitive and specific assay for the dopamine receptor. 26 references. (Author abstract modified)

248009 Aceto, Mario D. Department of Pharmacology, Medical College of Virginia Commonwealth University, Box 726, Richmond, VA 23298 **The antinicotinic effects of drugs with clinically useful sedative-anxiety properties.** *Pharmacology (Basel)*. 13(5):458-464, 1976.

A study of the relationship of the antinicotinic effects of a wide variety of CNS drugs to their clinical properties is presented. Mice were given a drug and two hours later were challenged with a lethal dose of nicotine. Amitriptyline, imipramine, doxepin, meprobamate, chlordiazepoxide, diazepam, trifluoroperazine, haloperidol, thioridazine, chlorpromazine, phenobarbital, propranolol and diphenylhydantoin were all found to be active in protecting mice against convulsions and lethality. Iproniazid, tranlycypromine, atropine, benztropine and trimethadione were found to be inactive. A relationship appears to exist between blockage of nicotine induced extensor convulsions and lethality in mice and sedative/anxiety effects in man. This relationship was found to be especially true for drugs designated antidepressant, antianxiety and antipsychotic. 23 references. (Author abstract modified)

248159 Samanin, Rosario; Garattini, Silvio. Istituto di Ricerche Farmacologiche 'Mario Negri', Via Eritrea, 62 - 20157 Milano, Italy **The serotonergic system in the brain and its possible functional connections with other aminergic systems.** *Life Sciences (Oxford)*. 17(8):1201-1210, 1975.

A brief review of some of the experiments suggesting a mutual role of both catecholamines and serotonin in the brain is presented. The existence of two central opposing systems regulating various brain functions was proposed as early as 1957 by Brodie and Shore on the basis of their pharmacological findings. According to the Hess concept of the argotropic and trophotropic subcortical divisions coordinating autonomic, somatic and psychic functions, it was postulated that these systems utilize noradrenaline (NA) and serotonin (5-HT) respectively as their neurotransmitters and the central effects of various drugs such as reserpine, chlorpromazine, LSD and others were explained in relation to their action on these systems. Convincing evidence of a mutual involvement of monoamines in a physiological situation has also been obtained in a series of extensive experiments by Jouvet who suggests that serotonin and noradrenaline in the brain regulate antagonistically the cortical synchronizing and desynchronizing mechanisms which operate during the slow wave sleep and waking. Although various situations such as regulation of body temperature, sexual behavior, and others have been described in which serotonin and catecholamines appear to be antagonistic, only more recently has biochemical and pharmacological evidence of a mutual interaction between these substances in the brain been obtained. It is concluded that because of the methodological limitations, it is difficult to accept or discard with certainty any hypothesis, and that future work and new methodologies and strategies should be designed to solve such complex problems. 79 references. (Author abstract modified)

248274 Lal, Harbans; Numan, Robert. Department of Pharmacology and Toxicology, University of Rhode Island, College of Pharmacy, Kingston, RI 02881 **Blockade of morphine-withdrawal body shakes by haloperidol.** *Life Sciences (Oxford)*. 18(2):163-167, 1976.

The effect of haloperidol on body shakes in rats physically dependent on morphine sulfate is studied. Physical dependence was produced in male hooded rats through intravenous injections of morphine sulfate in escalating dosages. Characteristic

"wet dog" like body shakes were observed during periods of withdrawal from the drug. Intraperitoneal injections of haloperidol were administered, and were observed to suppress these body shakes in a dose dependent manner. Although the mechanism by which haloperidol reduces morphine withdrawal signs is not known, behavioral and neurochemical similarities to narcotic analgesics are traced. It is suggested that whereas the body shakes may be due to an imbalance of speculatively suggested neurotransmitter functioning in the extrapyramidal system, haloperidol may correct that imbalance by its action of blocking the dopamine receptors, which have been supersensitized by morphine dependence, and by blocking the presynaptic coupling between nerve impulses and dopamine release. 25 references. (Author abstract modified)

248276 Cohn, Major L.; Cohn, Marthe; Taylor, Floyd H. Department of Anesthesiology, Magee-Womens Hospital, Pittsburgh, PA 15213 **Measurements of brain amobarbital concentrations in rats anesthetized and overdosed with amobarbital and treated centrally with dibutyl cyclic AMP.** *Life Sciences (Oxford)*. 18(2):261-265, 1976.

The effects of dibutyl cyclic AMP on the measurement of brain amobarbital concentrations in rats anesthetized and overdosed with amobarbital are studied. Previously, it had been found that dibutyl cyclic AMP dose relatedly shortens amobarbital induced narcosis and is an effective antidote to barbiturate overdosage in the rat and squirrel monkey. Three doses of amobarbital, an anesthetic dose (80mg/kg), a minimum lethal dose (130mg/kg), and a high lethal dose (180mg/kg) were administered intraperitoneally to groups of rats. All rats were injected intracerebroventricularly with 0.9% saline or dibutyl cyclic AMP, 200micrograms per rat. While those rats treated with saline solution were still sleeping at decapitation and those treated with dibutyl cyclic AMP were awake, there were no significant differences in their brain concentrations of amobarbital. Results demonstrate that dibutyl cyclic AMP does not antagonize amobarbital induced narcosis by altering brain concentrations of amobarbital; the hypothesis of redistribution of amobarbital within the brain is ruled out. 12 references. (Author abstract modified)

248284 Abdallah, Abdulmunim H.; Roby, Douglas, M.; Boeckler, Walter H.; Riley, Charley C. Pharmaceutical R & D, Dow Lepetit, Midland, MI **Role of DA in the stimulant effect of DITA in mice; comparison with d-amphetamine.** *European Journal of Pharmacology (Amsterdam)*. 35(1):29-34, 1976.

The effect of DL-alpha methyltyrosine (alpha-MT), 6-hydroxydopa (6-OH DOPA), haloperidol, phenoxybenzamine and propranolol on the stimulant activity of the anorexigenic agents (3',4'-dichloro-2(2-imidazolyl-2-ylthio)-acetophenone HBr) (DITA) and d-amphetamine is studied in male mice. It was found that pretreatment of mice with alpha-MT (32, 64mg/kg i.p.), significantly reduced the increase in motor activity induced by DITA or d-amphetamine. On the other hand, pretreatment of mice with 6-OH Dopa, 100, 150mg/kg did not significantly alter the stimulant effect of either DITA or d-amphetamine. In the case of haloperidol, it significantly reduced the increase of motor activity induced by DITA or d-amphetamine; propranolol and phenoxybenzamine were ineffective. Results support the hypothesis that the stimulant effect of DITA and d-amphetamine depends mainly on the integrity of the central dopaminergic rather than the noradrenergic system. 25 references. (Author abstract)

248286 Miller, Richard J.; Kelly, Peter H.; Neumeier, John L. M. R. C. Neurochemical Pharmacology Unit, Department

of Pharmacology, Medical School, Hills Road, Cambridge CB2 2QD, England **Apomorphines 15: action of aporphine alkaloids on dopaminergic mechanisms in rat brain.** *European Journal of Pharmacology* (Amsterdam). 35(1):77-83, 1976.

Action of aporphine alkaloids on dopaminergic brain mechanisms is investigated in rats. Of 11 aporphine analogs tested on striatal adenylate cyclase only (-)apomorphine and (+ or -)-N-n-propylnorapomorphine (+ or -)(NPA) were effective in stimulating the cyclase from rat brain. Inactive compounds included (+ or -)-isoapomorphine, (-)-1,2-dihydroxyapomorphine and (+ or -)-10-hydroxy-N-n-propylnorapomorphine. (+)-Bulbocapnine was an effective antagonist of the stimulating effects of dopamine or (-)-apomorphine on striatal adenylate cyclase. Injection of (-)-apomorphine into the lateral ventricle of rats with unilateral 6-hydroxydopamine induced lesions of the nigrostriatal pathway caused the animals to rotate away from the side of the lesion. Intraventricular injection of 25micrograms (+ or -)-10-hydroxy-N-n-propylnorapomorphine was found ineffective in producing rotation. The results are discussed in relation to the structural requirements for CNS dopamine receptor agonists. It is noted that the in vivo effects of these compounds may be modified by drug metabolism and pharmacokinetic factors. 30 references. (Author abstract modified)

248288 Fuxe, Kjell; Agnati, Luigi F.; Ungerstedt, Urban. Department of Histology, Karolinska Institutet, Stockholm, Sweden **The effect of mepiprazole on central monoamine neurons. Evidence for increased 5-hydroxytryptamine and dopamine receptor activity.** *European Journal of Pharmacology* (Amsterdam). 35(1):93-107, 1976.

The effect of mepiprazole on central monoamine neurons was examined for evidence of increased 5-hydroxytryptamine (5-HT) and dopamine (DA) receptor activity. Findings indicated that: 1) a pyrazolyl derivative with a phenyl piperazine side chain (PAP) exerts marked effects on central DA and 5-HT neurons; 2) 5-HT brain turnover was reduced with doses down to 0.25mg/kg and a spontaneous overflow of radioactivity from 3H-5-HT-labeled cortical slices was markedly increased, suggesting that PAP may cause extragranular release of 5-HT stores; 3) sexual behavior in the female rat, which is controlled by an inhibitory 5-HT pathway, is inhibited by low doses; 4) the extensor hindlimb reflex which is dependent upon 5-HT receptor activity was only increased with higher doses (2.5-10mg/kg), suggesting that the spinal 5-HT nerve terminals are less sensitive to the releasing action of PAP; 5) PAP actions on the DA neurons mainly involve a presynaptic action in the DA nerve terminals leading to increased DA receptor activity; 6) PAP mimics amphetamine and not apomorphine in the rotometer model which reveals change in DA receptor activity; 7) brain noradrenaline (NA) turnover is only significantly increased with somewhat higher doses (5-10mg/kg) and may be related to NA receptor blockade. It is suggested that the extragranular release of 5-HT caused by PAP is partly responsible for the inhibition of conditioned avoidance behavior and the reduction of threatening behavior found after low doses. It is thought that PAP may prove clinically useful in treating depressions due to 5-HT deficiency and that its action on DA terminals may also be helpful in this respect. When combined with L-Dopa PAP may, through its action on DA uptake and release, also help alleviate the motor deficits in parkinsonian patients with a moderate degree of degeneration of the DA system. 40 references. (Author abstract modified)

248291 Garattini, Silvio; Consolo, Silvana; Chitto, Giuseppe; Peri, Giuseppe; Ladinsky, Herbert. Istituto di Ricerche Farmacologiche 'Mario Negri', Via Eritrea, 62, 20157 Milan, Italy **Effect of nomifensine on acetylcholine and choline in the rat striatum and brainstem.** *European Journal of Pharmacology* (Amsterdam). 35(1):199-201, 1976.

The effect of nomifensine on acetylcholine and choline in the striatum and brainstem is examined in female rats to determine whether the compound, by stimulating the dopaminergic system indirectly via an increased availability of dopamine (DA) at the receptor sites, is also able to increase striatal acetylcholine as do amphetamine, pibedil and apomorphine. Nomifensine at a dose of 40mg/kg, was observed to increase rat striatal acetylcholine slightly but significantly 60 min after i.p. administration without affecting choline levels or choline O-acetyltransferase and cholinesterase activities. The drug had no effect on brainstem acetylcholine. In contrast, d-amphetamine and desipramine both produced a small but significant increase in brainstem acetylcholine. It is suggested that nomifensine increased striatal acetylcholine indirectly through blockade of DA uptake. Further research to clarify the suggested existence of a link between the noradrenergic and cholinergic systems in the brainstem is recommended. 10 references.

248349 Kastin, Abba J.; Nissen, Cheryl; Nikolics, Karoly; Medzihradsky, Kalmen; Coy, David H.; Teplan, Istvan; Schally, Andrew V. Endocrinology Section of the Medical Service, Veterans Administration Hospital, 1601 Perdido St., New Orleans, LA 70146 **Distribution of 3H-alpha-MSH in rat brain.** *Brain Research Bulletin*. 1(1):19-26, 1976.

Effects of alpha-MSH on the central nervous system are investigated. Radioactive synthetic alpha-MSH, prepared by selective tritiation of its dibromo-L-tyrosine2-derivative, was injected into the carotid artery of intact, hypophysectomized or pinealectomized rats. More radioactivity was found in the occipital cortex, cerebellum, and pons medulla than in most other brain parts of rats decapitated 15 sec and, to a less significant extent, 30 min after injection. Part of this radioactivity behaved like alpha-MSH, in several identification procedures. After administration of 3H-tyrosine, the least radioactivity was consistently found in the pons medulla. Large amounts of radioactivity after 3H-alpha-MSH were found in the pituitary and, particularly in the hypophysectomized rats, in the pineal. The half time disappearance of the first component of radioactivity from the blood of each group of rats injected with tritiated alpha-MSH was found to be no more than 2.5minutes, a time considerably shorter than the behavioral and EEG effects of this pituitary hormone on visual attention. It is concluded that the accumulation of radioactivity in the occipital cortex of the rat after injection of 3H-alpha-MSH is compatible with involvement of this brain area in the process of visual attention. 34 references. (Author abstract modified)

248358 Oomura, Yutaka; Ono, Taketoshi; Sugimori, Mitsuyuki; Wayner, Matthew J. Department of Physiology, Kyushu University, Fukuoka 812, Japan **Acetylcholine, an inhibitory transmitter in the rat lateral hypothalamus.** *Brain Research Bulletin*. 1(1):151-153, 1976.

Basolateral stimulation of the amygdala inhibited spontaneous firing of rat lateral hypothalamic neurons. The inhibition was augmented by eserine and blocked by atropine. Acetylcholine mimicked the inhibition and produced approximately 15mV of hyperpolarization beyond the original resting membrane potential which stopped spontaneous firing. The ACh effects were found to be reversible. Results indicate that

ACh might be an inhibitory transmitter involved in LH inhibition by AL stimulation. 14 references. (Author abstract)

248408 Cheng, Hsien C.; Bhatnagar, Ranbir K.; Long, John P. Department of Pharmacology Merrell-National Laboratories, Cincinnati, OH 45215 **Dopaminergic nature of amphetamine-induced pecking in pigeons.** *European Journal of Pharmacology* (Amsterdam). 33(2):319-324, 1975.

An investigation of the dopaminergic nature of amphetamine induced pecking in pigeons is reported. d-Amphetamine was found to induce a pecking response in pigeons, which was antagonized by chlorpromazine, haloperidol or bulbocapnine, indicating that this pecking response was caused by dopaminergic stimulation. Pretreatment of pigeons with alpha-methyltyrosine (alpha-MT) reduced d-amphetamine induced pecking, while the combined treatment of pigeons with alpha-MT and L-dihydroxyphenylalanine (L-Dopa, 100mg/kg) partially restored the pecking response. d-Amphetamine induced pecking was not reduced by a dopamine-beta-hydroxylase inhibitor, 1-phenyl-3-(2-thiazolyl)-2-thiourea (U-14,624). Alpha-MT reduced brain dopamine but not norepinephrine level, whereas U-14,624 decreased brain norepinephrine but not dopamine. Thus there is a correlation between brain dopamine level and d-amphetamine induced pecking response. It is concluded that d-amphetamine induced pecking is mediated indirectly by the release of dopamine. 16 references. (Author abstract modified)

248409 Chang, C. Chiung; Su, M. Jai. Pharmacological Institute, National Taiwan University, Taipei, Taiwan 100, Republic of China. **Further evidence that extrinsic acetylcholine acts preferentially on extrajunctional receptors in the chick biventer cervicis muscle.** *European Journal of Pharmacology* (Amsterdam). 33(2):337-344, 1975.

The specificity of action of extrinsic acetylcholine on extrajunctional and junctional receptors in the chick biventer cervicis muscle was studied by determining its ability to protect the responses evoked by acetylcholine and by tetanic nerve stimulation from the blockade by alpha-bungarotoxin, an irreversible binding agent of acetylcholine receptors. At concentrations of 50 to 100 micrograms/ml, acetylcholine caused a desensitization to extrinsic acetylcholine but not to nerve stimulation and protected only the contractile response to extrinsic acetylcholine from the toxin blockade whereas neither the response to tetanic nerve stimulation nor the endplate potentials were protected. For the protection of the latter, higher concentrations of acetylcholine were needed. In the presence of physostigmine, a concentration of acetylcholine as low as 10/ml protected the endplate potentials from the toxin blockade. By contrast, d-tubocurarine protected the tetanic contraction and the endplate potentials induced by nerve stimulation at a concentration which produced the same protection of acetylcholine induced contraction as that produced by 50 to 100 micrograms/ml acetylcholine. It is concluded that in contrast to d-tubocurarine, extrinsic acetylcholine at low concentrations acts preferentially on the extrajunctional receptors in the absence of an anticholinesterase. 22 references. (Author abstract)

248410 Consolo, Silvana; Ladinsky, Herbert; Bianchi, Serenella. Istituto di Ricerche Farmacologiche 'Mario Negri', Via Eritrea 62, 20157 Milan, Italy **Decrease in rat striatal acetylcholine levels by some direct- and indirect-acting dopaminergic antagonists.** *European Journal of Pharmacology* (Amsterdam). 33(2):345-351, 1975.

Data concerning the effect of several classes of drugs with dopamine receptor blocking activity on rat striatal acetylcholine levels are presented as evidence in support of a dopaminergic - cholinergic link in the striatum. Several direct acting or indirect acting dopamine receptor antagonists were found to decrease rat striatal acetylcholine levels. The maximum decrease of about 50% was produced by pimozone (0.5mg/kg), by haloperidol (0.5mg/kg) and by reserpine (2.5mg/kg). The decreases in acetylcholine produced by pimozone and by haloperidol were found to be specific for the striatum and did not alter diencephalic, mesencephalic, cerebellar or hemispheric acetylcholine levels. Furthermore, these two drugs completely blocked the increase in striatal acetylcholine produced by the dopamine receptor agonist, apomorphine, and had no effect on striatal choline acetyltransferase and cholinesterase. It is suggested that haloperidol and pimozone act on the striatal cholinergic neurons through strong blockade of dopamine receptors. Reserpine presumably decreased striatal acetylcholine levels indirectly by depleting biogenic amines. Clozapine and 1-fenfluramine were unable to block the action of apomorphine, as was shown previously for chlorpromazine. It is thus suggested that these drugs are reversible dopamine receptor antagonists. Their weaker action in decreasing striatal acetylcholine may depend upon this property. 31 references. (Author abstract modified)

248413 Westfall, David P.; Fedan, Jeffrey S. Department of Pharmacology, West Virginia University Medical Center, Morgantown, WV 26506 **The effect of pretreatment with 6-hydroxydopamine on the norepinephrine concentration and sensitivity of the rat vas deferens.** *European Journal of Pharmacology* (Amsterdam). 33(2):413-417, 1975.

An investigation of the effect of pretreatment with 6-hydroxydopamine on the norepinephrine concentration and sensitivity of the rat vas deferens is reported. It is noted that injection of 6-hydroxydopamine via the dorsal vein of the penis resulted in a marked depletion of the endogenous norepinephrine of the vas deferens. Seven days after pretreatment with 6-hydroxydopamine, there was a shift to the left and an increase in the maxima of the dose response curves for norepinephrine and methoxamine. It is concluded that pretreatment with 6-hydroxydopamine produces denervation of the vas deferens and that the in vitro tissue exhibits both prejunctional and postjunctional supersensitivity. 10 references. (Author abstract modified)

248466 Seeman, P.; Lee, T. Pharmacology Department, University of Toronto, Toronto, Ontario, Canada M5S 1A8 **Antipsychotic drugs: direct correlation between clinical potency and presynaptic action on dopamine neurons.** *Science*. 188(4194):1217-1219, 1975.

The mechanism by which neuroleptic (antipsychotic) drugs achieve their tranquilizing action and side effects is investigated. Effects of 23 such drugs upon the electrically stimulated release of 3H-dopamine were studied on neostriatal slices of rat brain. It was observed that the drugs inhibited 3H-dopamine release. The concentrations for 50% inhibition (ranging from 11.5nanomolar for spiperidol to 800 nanomolar for thioridazine) correlated closely with the average daily dosages of 25 neuroleptic drugs used clinically for schizophrenia. The correlation includes butyrophenones, phenothiazines, reserpine, pimozone, clozapine and (+) butaclamol. Clinically inactive isomers (trans-thiothixene, trans-flupenthixol, and (-)-butaclamol) required 20 to 1000 times higher concentrations than the active isomers to inhibit release. Compared to the inhibition of 3H-dopamine release,

much higher neuroleptic concentrations were needed to inhibit the electrically stimulated release of other neurotransmitters-(3H) acetylcholine, and gamma-aminobutyric acid (3H-GABA). It is concluded that the neuroleptic drugs may block the presynaptic coupling between impulse and neurosecretion. The coupling blockade hypothesis of neuroleptic action is supported. 22 references. (Author abstract modified)

248513 Marshall, A.; Hirst, M. Department of Pharmacology, University of Western Ontario, London **Potential of ethanol narcosis by dopamine and L-dopa-based isoquinolines**. *Experientia* (London). 32(2):201-203, 1976.

The hypothesis that derived isoquinolines may participate in the observed potentiation of the soporific action of ethanol in mice when dopamine or L-dopa are coadministered is tested. The isoquinolines, salsolinol and 3-carboxysalsolinol were found to prolong ethanol induced narcosis in mice. Pretreatment with carbidopa was observed to increase the effect of 3-carboxysalsolinol but not of salsolinol. These results suggest that ethanol sleeping time potentiation by L-dopa may involve a partial conversion to the isoquinoline in vivo. A central depressant action of salsolinol or the 3-carboxy analogue is suggested. 19 references. (Author abstract modified)

248515 Heller, B.; Lumbreras, N. Laboratorios de Psicofarmacologia Hospital Nacional de Neuropsiquiatria Barracas 375, Buenos Aires, Argentina **Studies on the role of phenethylamine in methylamphetamine action mechanism**. *Experientia* (London). 32(2):210-212, 1976.

The role of phenethylamine in methylamphetamine action mechanisms is investigated in rats. The proposition that central and behavior amphetamine effects may be mediated by phenethylamine release and/or by an occupation of active phenethylamine receptors by amphetamine is examined. Assays of lethal effects of N-methylamphetamine and of phenethylamine were carried out with groups of 20 male and female rats. Blocking of conditioned responses was assayed according to the method of Cook and Weidley (1957). The effective dose was calculated. The conditioned-response tests were repeated after ten days of treatment with N-methylamphetamine and phenethylamine, respectively. Results indicate that the tolerance developed to central effects of N-methylamphetamine are caused by the liveration and posterior depletion of phenethylamine from its storage places. The hypothesis concerning the action mechanisms of amphetamines in the CNS is supported. 16 references.

248516 Johnson, F. N. University of Lancaster, Department of Psychology, Bailrigg, Lancaster, England **Lithium effects upon components of activity in rats**. *Experientia* (Basel). 32(2):212-214, 1976.

Behavioral effects of lithium chloride are studied in rats. When lithium chloride was administered to rats several changes occurred in a number of components of activity, some of which were sex related. There was a reduction in both ambulatory and rearing activity and in behavior associated particularly with the mouth and nose. The findings are related to a suggestion that lithium effects on behavior may be more subtle than hitherto thought. 7 references. (Author abstract modified)

248551 Staneva-Stoytcheva, D.; Rainova, L.; Georgieva, A. Department of Pharmacology and Toxicology, Faculty of Pharmacy, Dunav, str. 2, Sofia, Bulgaria **Changes in the arterial blood pressure responses of hypertensive rats to some drugs acting on the central sympathetic mechanisms**. *Agressologie* (Paris). 16(B):15-18, 1975.

Changes in arterial blood pressure caused by physostigmine (40 micrograms/kg i.v.) and clonidine (50 micrograms/kg) are investigated in normotensive rats and in rats with different types of hypertension (spontaneous, DOC-NaCl, and Goldblatt). A decreased hypertensive effect of physostigmine was established in the rats with spontaneous hypertension, while no differences were observed in the hypertensive response of the rats with metacorticoid and Goldblatt's hypertension. Some quantitative differences in the intensity and in the duration of the initial pressor phase and the hypotensive effect of clonidine were observed in rats with spontaneous and experimental hypertension in comparison with control rats. Demedullation of the animals was carried out to analyze the role of the central and peripheral adrenergic mechanisms in experimental hypertension. It is concluded that the role of the central adrenergic mechanisms in the pathogenesis of hypertension is still not completely elucidated. It is further concluded that there are differences in the activity of the central, and perhaps of the peripheral adrenergic mechanism in various types of experimental and spontaneous hypertension. 17 references. (Author abstract modified)

248552 Vlahov, V. Department of Pharmacology, Medical Academy, Faculty of Medicine, Sofia, Bulgaria **Role of the prostaglandins in the regulation of the cerebral blood circulation**. *Agressologie* (Paris). 16(B):31-34, 1975.

Roles of Indomethacin and the prostaglandin Pg F2 in regulating cerebral blood circulation are investigated in cats, in two separate series of experiments. In the first series pial vessels (20 to 200 microns) were exposed after craniotomy on cats under Nembutal narcosis. The perivascular space was then perfused with mock cerebrospinal fluid, with and without the added pharmacological agents. Localized constrictions in the region of the microperfusion were provoked by electrical stimulation with DC impulses and by the change of the perivascular pH. It was established that Indomethacin suppressed the electrically induced constrictions, without affecting the constrictions due to change in pH. In the second series of experiments, changes in the local cerebral blood flow (CBF) of the cortex were measured. The increase of the cerebral blood flow caused by inhalation of carbogen and the reactive hyperemia observed after stopping the clamping of both carotid arteries were found to be suppressed by intravenously applied Indomethacin in the cats. When the prostaglandin Pg F2 was introduced intravenously, these effects were observed to be reestablished. The decrease of the cerebral blood flow caused by hyperventilation of the animal is not observed to be affected by Indomethacin; neither are cortical pH changes. 7 references. (Author abstract modified)

248600 Haubrich, Dean R.; Wang, Paulina F. L.; Herman, Raymond L.; Clody, Donald E. Squibb Institute for Medical Research, Department of Pharmacology, Princeton, NJ 08540 **Acetylcholine synthesis in rat brain: dissimilar effects of clozapine and chlorpromazine**. *Life Sciences* (Oxford). 17(5):739-747, 1975.

A report is presented in which treatment of rats with either clozapine or chlorpromazine reduced the concentration of acetylcholine in the corpus striatum. The rate of synthesis of acetylcholine, estimated from the rate of incorporation of intravenously administered choline (methyl-3H) into acetylcholine, was at least three times greater in the corpus striatum than in the cortex of rats killed by microwave irradiation. Administration of chlorpromazine (10mg/kg) orally to rats induced a decrease in the concentration of acetylcholine in the corpus striatum, but did not affect either the concentration of

acetylcholine in the cortex or its rate of synthesis in either brain region, as measured 3 hr after treatment. In contrast to the effect of chlorpromazine, however, treatment with clozapine (100mg/kg, p.o.) lowered the level of acetylcholine in both the corpus striatum and cortex, and reduced its rate of synthesis in these regions of the brain. The doses of clozapine and chlorpromazine that produced these dissimilar effects on metabolism of acetylcholine did induce equivalent changes in both the rate of avoidance responding and the metabolism of striatal dopamine in rats. The results suggest that clozapine reduces cholinergic neuronal activity in brain. This effect of clozapine may explain the lack of extrapyramidal side-effects in psychotic patients treated with the drug. 29 references. (Author abstract modified)

248603 Katz, Sherry; Cohen, Gerald. Department of Neurology, Mount Sinai School of Medicine, Fifth Avenue and 100th Street, New York, NY 10029 A comparison of 6,7-dihydroxy-tetrahydroisquinoline, salsolinol and tetrahydropapaveroline as inhibitors of monoamine oxidase within the adrenergic nerve plexus of the isolated mouse atrium. *Research Communications in Chemical Pathology and Pharmacology*. 13(2):217-224, 1976.

A study was conducted to compare 6,7-dihydroxy-tetrahydroisquinoline, (6,7-dihydroxyTIQ), salsolinol and tetrahydropapaveroline (THP) as inhibitors of MAO in the nerve plexus of the mouse atrium in vitro. Three dopamine derived TIQs were tested for their ability to inhibit MAO within the adrenergic plexus of atria from reserpinized mice. Inhibition of MAO was shown by improved accumulation of 3H-norepinephrine with a concomitant decrease in 3H-deaminated catechols. Salsolinol was less potent than 6,7-dihydroxy-TIQ as a MAO inhibitor. THP did not appear to inhibit MAO in this system. 9 references. (Author abstract modified)

248604 Tamir, Hadassah; Rapport, Maurice M. Division of Neuroscience, New York State Psychiatric Institute, New York, NY 10032 Is the serotonin binding protein (SBP) a soluble storage form for serotonin? *Research Communications in Chemical Pathology and Pharmacology*. 13(2):225-235, 1976.

The binding of serotonin to a soluble, high affinity binding protein (SBP) present in synaptosomes and associated with serotonergic tracts, has been studied for the effect of drugs and, in particular, drugs interacting with contractile proteins. Vincristine, vinblastine, and cytochalasin B were found to cause 50% inhibition of serotonin binding to SBP at 1.5×10^{-6} M, 7.5×10^{-6} M and 50×10^{-6} M respectively. Colchicine did not affect the binding at 1×10^{-3} M. When vinblastine was injected intraventricularly, the binding capacity of SBP isolated from brain 20 and 26 hr after injection was decreased 42% and 60% respectively. It is concluded that SBP is an actin like contractile protein, distinct from microtubulin, and not associated with membranes. The storage of serotonin through binding to a protein with such properties suggests that this compartment is in some way involved in the translocation or transfer of serotonin from one part of the cell to another. 17 references. (Author abstract)

248697 Lydiard, R. B.; Fossum, L. H.; Sparber, S. B. Department of Pharmacology, University of Minnesota, Minneapolis, MN 55455 Postnatal elevation of brain tyrosine hydroxylase activity, without concurrent increases in steady-state catecholamine levels, resulting from di-alpha-methylparatyrosine administration during embryonic development. *Journal of Pharmacology and Experimental Therapeutics*. 194(1):27-36, 1975.

The specificity of previously reported catecholamine (CA) depletion resulting from alterations in the control mechanism during a critical period of development was examined using di-alpha-methyl-p-tyrosine (AMPT) as a depleting agent. AMPT, injected in varying doses into the yolk sac of fertilized chicken eggs prior to incubation, caused embryonic CA depletion by day 10 of embryogenesis but repletion had occurred by 20 days of embryogenesis. TH activity in whole brain and brain parts was elevated in a dose related fashion at 29 days postnatally by AMPT. However, no changes in steady state CA levels in whole brain were observed at this time after AMPT. Differences in the responses to reserpine and AMPT are discussed with respect to their pharmacological actions. It is concluded that early embryonic CA depletion can result in long-term increases in TH activity postnatally, but steady state levels of product need not necessarily be altered. 43 references. (Author abstract modified)

248699 Heikkila, Richard E.; Orlansky, Herbert; Mytilineou, Catherine; Cohen, Gerald. Department of Neurology, Mount Sinai School of Medicine, 100 Street and 5th Avenue, New York, NY 10029 Amphetamine: evaluation of d- and l-isomers as releasing agents and uptake inhibitors for 3H-dopamine and 3H-norepinephrine in slices of rat neostriatum and cerebral cortex. *Journal of Pharmacology and Experimental Therapeutics*. 194(1):47-56, 1975.

Release of 3H-dopamine or of 3H-norepinephrine and inhibition of accumulation of 3H-dopamine or 3H-norepinephrine by d-amphetamine and l-amphetamine were studied in slices of rat neostriatum and in slices of rat cerebral cortex. It was found that the two stereoisomers of amphetamine were equally potent as inhibitors of accumulation in the cortex, whereas d-amphetamine was approximately 3 fold more potent than l-amphetamine in the neostriatum. A similar relationship was observed between the two stereoisomers in release experiments. It was determined that the apparent releasing action of d-amphetamine in the neostriatum was not due to blockade of reuptake of spontaneously released material and that d-amphetamine itself must be taken up to evoke a releasing action. In the cortex, uptake inhibition of 3H-norepinephrine was greater than release over a wide concentration range, while in the neostriatum the two actions were essentially identical in magnitude for 3H-dopamine. It is concluded that in the cortex d-amphetamine can act both to release and to block uptake of 3H-dopamine by d-amphetamine, but that the apparent blockade of uptake is of questionable significance and appears to result from the release of previously accumulated 3H-dopamine. 22 references. (Author abstract modified)

248700 Trabucchi, M.; Cheney, D. L.; Hanin, I.; Costa, E. Laboratory of Preclinical Pharmacology, National Institute of Mental Health, Saint Elizabeths Hospital, Washington, DC 20032 Application of principles of steady-state kinetics to the estimation of brain acetylcholine turnover rate: effects of oxotremorine and physostigmine. *Journal of Pharmacology and Experimental Therapeutics*. 194(1):57-64, 1975.

The turnover rate of acetylcholine (ACh) in the brains of mice injected with doses of oxotremorine and physostigmine, which cause a prolonged increase of ACh concentration, was measured through an application of principles of steady state kinetics to the change with time of brain choline (Ch) and ACh specific radioactivities after an intravenous pulse injection of phosphorylcholine. It was found that when the concentration of brain ACh and Ch is increased to a new steady state as a result of oxotremorine and physostigmine injections the turnover rate of brain ACh decreases from 0.34 micromol/g/hr (in

saline treated mice) to 0.12 and 0.061 micromol/g/hr, respectively. The possibility that an increase of brain Ch or ACh concentrations plays a role in the control of brain ACh turnover rate is discussed. 19 references. (Author abstract modified)

248701 Banerjee, Shailesh P.; Snyder, Solomon H.; Mechoulam, Raphael. Johns Hopkins University School of Medicine, Baltimore, MD 21205 **Cannabinoids: influence on neurotransmitter uptake in rat brain synaptosomes**. *Journal of Pharmacology and Experimental Therapeutics*. 194(1):74-81, 1975.

The effect of delta1-tetrahydrocannabinol (delta-1-THC) and 12 of its derivatives on the uptake of 3H labeled norepinephrine (NE), dopamine (DA), serotonin (5-HT) and gamma-aminobutyric acid (GABA) into synaptosomes in homogenates of various regions of rat brain is examined. It was found that delta-THC, inhibits the accumulation of NE and 5-HT into hypothalamic preparations and DA into the corpus striatum with K_i values of about 12 to 25 microM, while GABA uptake into cerebral cortical preparations is inhibited less ($K_i = 140$ microM). The affinities of delta-THC 7-hydroxy-delta-THC, 7-hydroxydelta-THC and cannabidiol for 5-HT, NE and GABA transports are similar to val values for delta-THC, while cannabigerol, cannabinol and delta-6-THC-7-oic acid have substantially less affinity. Thus, hydroxylation of C-7 in delta-6-THC does not alter inhibitory potency, but its oxidation to an acid and aromatization of ring A greatly reduce affinity. The hydroxyl at C3(1) of ring C is critical for inhibition of NE, 5-HT and GABA uptake, since its acetylation or methylation abolishes activity. Inhibition of NE, DA, 5-HT and GABA uptake by all cannabinoids examined is non-competitive. Only about 1% of delta-THC and delta-6-THC and 5% of cannabidiol were fully soluble under the experimental conditions. 23 references. (Author abstract)

248703 Creese, Ian; Snyder, Solomon H. Department of Pharmacology, 725 N. Wolfe Street, Baltimore, MD 21205 **Receptor binding and pharmacological activity of opiates in the guinea-pig intestine**. *Journal of Pharmacology and Experimental Therapeutics*. 194(1):205-219, 1975.

A comparison was made between the affinities of a wide range of opiate agonists, mixed agonist antagonists, and antagonists for opiate receptor binding sites in the guinea-pig intestine longitudinal muscle and myenteric plexus preparation, and their pharmacological potency in influencing the electrically induced contraction of this in vitro functional system. The relative affinities of drugs and the degree of stereospecificity for intestinal binding sites were found to be closely similar to these properties in the brain. Receptor binding correlated extremely well with pharmacological potency, both for agonists and antagonists, indicating that binding involves pharmacologically relevant opiate receptors. Pharmacological activity correlated best with receptor binding assayed in the presence of sodium. 43 references. (Author abstract)

248724 Kato, A. C.; Collier, B.; Ilson, D.; Wright, J. M. Department of Biochemistry, College de France, 11 Place Marcelin Berthelot, Paris, France **The effect of atropine upon acetylcholine release from cat superior cervical ganglia and rat cortical slices: measurement by a radio-enzymic method**. *Canadian Journal of Physiology and Pharmacology* (Ottawa). 53(6):1050-1057, 1975.

An investigation of the effect of atropine upon acetylcholine (ACh) release from cat superior cervical ganglia and rat cortical slices is reported. The release of ACh was measured by a

radio enzymic method. Atropine (3×10 to the minus six M) increased (3.5 to 4 fold) the amount of ACh released by rat's sliced cerebral cortex incubated in a high (23 mM) potassium medium. However, atropine (3×10 to the minus six to 3×10 to the minus five M) did not change the amount of ACh released by ganglia during preganglionic nerve stimulation (5 to 10 Hz). It is concluded that cholinergic nerve terminals in different tissues appear to have different pharmacological properties. 23 references. (Author abstract modified)

248725 Phillis, J. W.; Kostopoulos, G. K.; Odutola, A. Department of Physiology, College of Medicine, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0, Canada **On the specificity of histamine H2-receptor antagonists in the rat cerebral cortex**. *Canadian Journal of Physiology and Pharmacology* (Ottawa). 53(6):1205-1209, 1975.

The effects of iontophoretically applied histamine H2 receptor antagonists and their antagonism of various amines, acetylcholine (ACh), and adenosine 5'-monophosphate (5'-AMP) were studied on spontaneously active rat cerebral cortical neurons. Metiamide was found to selectively block the depressant actions of histamine. Burimamide, in amounts necessary for histamine antagonism, also antagonized the depressant effects of noradrenaline, dopamine, and 5-hydroxytryptamine. Neither antagonist affected 5'-AMP induced depressions, but both reduced or blocked the excitatory actions of ACh. It is concluded that metiamide may be useful as a reliable antagonist of H2 receptors on cerebral cortical neurons. 12 references. (Author abstract)

248834 VonVoigtlander, P. F.; Losey, E. G. Upjohn Company, Kalamazoo, MI 49001 **On the use of selective neurotoxic amine analogs to measure the blockade of norepinephrine and 5-hydroxytryptamine uptake systems by antidepressants**. *Research Communications in Chemical Pathology and Pharmacology*. 13(3):389-400, 1976.

A series of experiments designed to determine if antidepressant drugs might antagonize 6-hydroxydopa(6-OH-D) induced norepinephrine (NE) depletions, adapt p-chloromethamphetamine (p-CMA) antagonism as an assay for measuring the blockade of 5-hydroxytryptamine (5-HT) uptake system, and to determine if anxiolytic activity antagonizes the effects of antidepressants is reported. It was found that in pargyline or carbidopa pretreated mice, 6-OH-D causes a depletion of brain NE. Several antidepressant compounds block the depletion after pargyline but not after carbidopa pretreatment. Similarly, p-CMA induced depletion of brain 5-HT is blocked by several antidepressants. Diazepam antagonizes the ability of imipramine to block the NE depletion induced by 6-OH-D but not the 5-HT depletion induced by p-CMA. It is concluded that the blockade of selective neurotoxic induced depletions of biogenic amines is a useful in vivo technique for determining the effects of drugs on the amine uptake systems. However, the results for compounds with mixed antidepressant/anxiolytic activity must be viewed with caution. 15 references. (Author abstract modified)

248880 Mannino, Robert A.; Wolf, Harold H. College of Pharmacy, Ohio State University, Columbus, OH 43210 **Morphine's proconvulsant action: importance of endogenous norepinephrine**. *Life Sciences* (Oxford). 16(11):1659-1668, 1975.

The ability of morphine sulfate to lower the chemoconvulsant threshold is examined in mice. Subject animals were pretreated with alpha-methyl-para-tyrosine (alpha-MT) methyl ester, FLA-63, phentolamine mesylate, L(-)-sotolol HCl, and pimozide. It was observed that FLA-63, alpha-MT, and phen-

tolamine pretreatment abolished the proconvulsant action of morphine, while L(-)-sotolol and pimozide pretreatment had no such effect. Results suggest that endogenous norepinephrine (NE), but not endogenous dopamine (DA) is required for the expression of increased central excitability associated with the acute administration of morphine. It is further suggested that activation of central alpha-adrenergic receptors appears to be a requirement for morphine's proconvulsant action in the mouse. 24 references. (Author abstract modified)

248947 Segal, David S.; Geyer, Mark A.; Weiner, Barry E. Psychiatry Department, School of Medicine, University of California, San Diego, La Jolla, CA 92037 **Strain differences during intraventricular infusion of norepinephrine: possible role of receptor sensitivity.** *Science*. 189(4199):301-303, 1975.

An experiment which tested the hypothesis that differential receptor sensitivities to norepinephrine exist in the various strains of the rat is reported. Two rat strains previously shown to differ with respect to behavioral activity, regional brain tyrosine hydroxylase activity, and norepinephrine elicited accumulation of adenosine 3',5'-monophosphate were infused for 3 hours with either 0.9% saline or L-norepinephrine bitartrate in a 0.9% saline vehicle. It was observed that the two strains exhibited differential behavioral responsiveness during the intraventricular infusion of norepinephrine. Results are interpreted in terms of differential catecholamine receptor sensitivity. 23 references. (Author abstract modified)

248951 Estler, C. -J. Pharmakologisches Institut, Universität Erlangen-Nürnberg, Universitätsstrasse 22, D-852 Erlangen, Germany **Dependence on age of methamphetamine-produced changes in thermoregulation and metabolism.** *Experientia* (Basel). 31(12):1436-1437, 1975.

The effect of age on methamphetamine induced changes in thermoregulation and metabolism is investigated in mice. It was found that juvenile mice injected with methamphetamine increased their oxygen consumption by 50% and that their body temperatures rose significantly. These changes in overall metabolism were accompanied by a decrease of 60% in the glycogen content of the liver and an increase in the plasma nonesterified fatty acids. Blood glucose level remained unchanged. In contrast, in older animals liver glycogen declined only 13% while blood glucose level dropped. Plasma nonesterified fatty acids increased more than in juvenile mice. Oxygen consumption was raised significantly and body temperature dropped. It is suggested that juvenile mice can easily mobilize their carbohydrate and lipid reserves and thus provide sufficient energy for thermogenesis and motor activity. 15 references.

248952 Guzek, J. W.; Piatek, Wieslawa. Department of Pathophysiology, School of Medicine, ul. Narutowicza 60, 90-136 Lodz, Poland **The uptake of 35S by hypothalamic and neurohypophyseal proteins following intraventricular injection of L-cysteine-35S-hydrochloride in rats dehydrated and reserpinized.** *Experientia* (Basel). 31(12):1443-1445, 1975.

The incorporation of 35S into TCA precipitable proteins of the hypothalamoneurohypophyseal system in dehydrated and reserpinized white rats is investigated. Seven rats were dehydrated for 48 hours and injected intraventricularly with L-cysteine-35S-hydrochloride. Nine others received the same treatment and were additionally injected with reserpine 1 day after water deprivation. Results show that the specific activity of the TCA precipitable material both in the hypothalamus and neurohypophysis diminishes under reserpine treatment. It is concluded that biosynthesis and release of neurohypophyseal

hormones in dehydrated animals are differentially influenced by reserpine. It is hypothesized that the existence of at least two kinds of reserpine sensitive supraoptic and paraventricular afferents of monoaminergic origin cannot be excluded, one stimulating the rate of neurohormone synthesis and the other inhibiting its release. 26 references.

248957 Gottesfeld, Zehava. Isotope department, Weizmann Institute of Science, Rehovot, Israel **Effect of lithium and other alkali metals on brain chemistry and behavior: I. Glutamic acid and GABA in brain regions.** *Psychopharmacologia* (Berlin). 45(3):239-242, 1976.

In an attempt to elucidate the effect of lithium in mania, the effect of lithium and other alkali metals on glutamic acid and GABA concentrations was studied in the rat. Glutamic acid and GABA concentrations were measured in brain areas of rats injected with the chloride salts of Li+, Na+, K+, Rb+ or Cs+ for 5 days. Regional changes in brain glutamic acid and GABA were found in animals after lithium, rubidium or cesium, but not potassium, compared to sodium treatments. Increased glutamic acid and GABA levels, caused by lithium and rubidium, were found in brain structures (hypothalamus and amygdala) known to be involved in emotional behavior. It is concluded that the regional changes in brain glutamate and GABA do not offer a simple explanation of how Li+ and Rb+ may be effective in the treatment of psychotic disorders. 26 references. (Author abstract modified)

248961 Magour, S.; Coper, H.; Fahndrich, Chr. Institut für Neuropsychopharmakologie, Freien Universität Berlin, D-1000 Berlin 19, Ulmenallee 30, Germany **The effect of chronic self-administration of d-amphetamine on food intake, locomotor activity, and C14-leucine incorporation into cerebral cortex protein.** *Psychopharmacologia* (Berlin). 45(3):267-270, 1976.

An investigation conducted in the rat to ascertain the effect of chronic self-administration of d-amphetamine on food intake, locomotor activity, and C14-leucine incorporation into cerebral cortex protein is reported. Rats had free access to 0.02% d-amphetamine solution instead of water for 23 days. The daily amphetamine consumption was found to increase from 16mg/kg on day 1 up to 47mg/kg on day 23. Tolerance to the anorectic effect of the drug was apparent on day 11. The initial depression in bodyweight persisted throughout the experiment. The hyperactivity of the rats remained at the same level despite the daily increase in amphetamine intake. The incorporation of C14-leucine into cerebral cortex proteins was initially increased and returned to control level after 2 weeks of treatment. No direct correlation between hyperactivity and brain cortex protein synthesis was observed. 17 references. (Author abstract modified)

248962 Cowan, Alan; MacFarlane, Ian R. Department of Pharmacology, Reckitt and Colman Ltd. Dansom Lane, Kingston-upon-Hull, HU8 7DS, England **Effect of morphine antagonists on drug-induced hyperthermia in mice and rats.** *Psychopharmacologia* (Berlin). 45(3):277-282, 1976.

The temperature profiles of the strong narcotic antagonists cyclazocine, diprenorphine and naloxone, and a new weak antagonist, RX 336-M, were compared with those of the reference compounds desmethylinipramine (DMI), morphine, and d-amphetamine in the rat and mouse in an attempt to discover their differential effects and produce insights into their possible modes of action. Diprenorphine, naloxone and morphine had no significant calorogenic effect in any test. Evidence of potential antidepressant activity for cyclazocine was based on a high dose preventing the development of reser-

pine induced hypothermia. RX 336-M reversed established hypothermia in the reserpine and alpha MT tests. Since this calorogenic action was not antagonized by naloxone it is concluded that narcotic receptors were probably not involved in the mediation of the effect. Although RX 336-M resembled desmethylinipramine and d-amphetamine in the reserpine (reversal) and apomorphine tests, contrasting data from the reserpine (prevention), oxotremorine and alpha MT tests indicated possible psychotropic activity based on different neurochemical mechanisms. 33 references. (Author abstract modified)

248979 Montel, H.; Starke, K.; Taube, H. D. Abteilung für Anesthesiologie, Klinikum der Universität Essen, Essen, Germany **Morphine tolerance and dependence in noradrenaline neurones of the rat cerebral cortex.** Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 288(4):415-426, 1975.

An investigation of morphine tolerance and dependence in noradrenaline neurones of the rat cerebral cortex is reported. By subcutaneous implantation of 2 or 13 morphine pellets (75mg), rats were made tolerant to and dependent on narcotic analgesics. Occipital cortex slices from dependent animals and placebo implanted controls were incubated with (-)-3H-noradrenaline and subsequently superfused with physiological salt solution. It was found that the accumulation of 3H-noradrenaline was not changed by pretreatment with 2, but was slightly decreased by pretreatment with 13 morphine pellets. The overflow of tritium evoked by electrical field stimulation was higher in slices from morphine implanted rats than in those from placebo controls. Morphine and levorphanol, added *in vitro*, inhibited the stimulation induced overflow of tritium at similar concentrations and to a similar degree in slices from morphine and placebo pretreated animals. It is concluded that, during chronic treatment with morphine, an adaptation takes place in the brain to compensate for the acute effect of narcotic analgesics. The chain of events from the drug receptor interaction to the depression of the release process can be excluded as substrate of this adaptation. During withdrawal, the compensatory changes provoke an enhanced increase of extracellular noradrenaline during nerve impulses. 17 references. (Author abstract modified)

248980 Montel, H.; Starke, K.; Taube, H. D. Abteilung für Anaesthesiologie, Klinikum der Universität Essen, D-43 Essen, Hufelandstr. 55, Germany **Influence of morphine and naloxone on the release of noradrenaline from rat cerebellar cortex slices.** Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 288(4):427-433, 1975.

In slices of rat cerebellar cortex preincubated with (-)-3H-noradrenaline, the influence of morphine and naloxone on the efflux of tritium was investigated. It was found that the spontaneous outflow was not changed by either morphine or naloxone. Morphine caused a concentration dependent decrease of the overflow of tritium evoked by electrical field stimulation. Naloxone did not change the stimulation induced overflow, but prevented its inhibition by morphine. It is concluded that morphine, through an action on opiate receptors located on cerebellar noradrenergic neurones, inhibits the secretion of the transmitter in response to nerve impulses. 25 references. (Author abstract modified)

249002 Friedman, Eitan; Rotrosen, John; Gurland, Mark; Lambert, G. A.; Gershon, Samuel. Neuropsychopharmacology Research Unit, N.Y.U. Medical Center, 550 First Avenue, New York, NY 10016 **Enhancement of reserpine-elicited dopaminergic supersensitivity by repeated treatment with**

apomorphine and alpha-methyl-p-tyrosine. Life Sciences (Oxford). 17(6):867-874, 1975.

To test the hypothesis that frequent receptor stimulation during a period of decreased synaptic transmission would prevent the development of supersensitivity, the effect of frequent administrations of apomorphine to rats during the development of reserpine elicited supersensitivity was examined. Contrary to expectations, a further enhancement of supersensitivity was seen when animals were challenged days later with apomorphine. It is speculated that this may be the result of presynaptic dopamine synthesis inhibition following apomorphine. Apomorphine induced enhancement of reserpine supersensitivity was not seen in animals challenged with amphetamine, alpha-methyl-p-tyrosine, but not scopolamine, repeatedly administered during the reserpinization mimics the effect of apomorphine, supporting the concept that the potentiating effects of apomorphine are mediated presynaptically. Furthermore, it is suggested that the direct presynaptic action of apomorphine, and not that mediated via cholinergic interneurons, is operant in the development of enhanced supersensitivity. 21 references. (Author abstract modified)

249027 Salama, A. I.; Goldberg, M. E. Department of Pharmacodynamics Warner-Lambert Research Institute, Morris Plains, NJ 07950 **Elevation of amphetamine levels in rat brain after administration of the choline acetyltransferase inhibitor 4-(1-naphthylvinyl) pirlidine (NVP).** Archives Internationales de Pharmacodynamie et de Therapie (Ghent). 215(2):197-201, 1975.

An investigation of the effect of 4-(1-naphthylvinyl) pyridine (NVP) on brain levels of amphetamine following injection of the latter in the rat is reported. It was found that following amphetamine administration both NVP and SKF-525A cause elevations in whole brain levels of amphetamine compared with saline treated controls. NVP was found to be about 3 times more active than SKF-525A; significant effects were obtained after doses of 0.625mg/kg and above. NVP also inhibited brain choline acetyltransferase *in vitro*. Following the administration of NVP (20 to 200mg/kg, *i.p.*), there was a dose dependent inhibition of this enzyme in brain. It is suggested that potentiation of the behavioral effects of amphetamine by NVP, which occur after doses of 5mg/kg of NVP, is probably related to its inhibitory effects on amphetamine metabolism. 16 references. (Author abstract modified)

249030 Reinis, S. Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada **Effects of hydroxylamine on the consequences of long-lasting administration of morphine in mice. I. Effect on the morphine tolerance.** Archives Internationales de Pharmacodynamie et de Therapie (Ghent). 215(2):222-229, 1975.

Data concerning the effect of hydroxylamine on morphine tolerance in the mouse are presented. Mice, C57BL/6J strain, were injected daily with increasing doses of morphine sulfate for 5 weeks. Twenty four hours after the final morphine administration, they were injected intracranially with 10, 20 or 50 microliters of a 0.3M solution of hydroxylamine. Two weeks later, hot plate testing indicated that hydroxylamine interfered with the developed tolerance of the mice to morphine. It is reported that this effect is dose dependent, and that the hydroxylamine injected tolerant animals more resemble nontolerant mice. It is suggested that hydroxylamine not only reverses the morphine tolerance, but also makes the animals even more sensitive to morphine. 21 references. (Author abstract modified)

249031 Reinis, S. Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada **Effects of hydroxylamine on the consequences of long-lasting administration of morphine in mice. II. Time course of the hydroxylamine effect on morphine tolerance.** Archives Internationales de Pharmacodynamie et de Therapie (Ghent). 215(2):230-237, 1975.

Data concerning the time course of the hydroxylamine effect on morphine tolerance in the mouse are presented. It is reported that mice injected for 35 days with morphine sulfate in increasing doses did not show tolerance to the analgesic effects of morphine if injected intracranially with 0.3M hydroxylamine. The excitatory action of morphine was unaffected. The interference with tolerance lasted for at least 6 weeks following the hydroxylamine injection. There were no apparent histological changes in the brains of treated mice as well as no differences in the composition of water soluble brain proteins. 5 references. (Author abstract modified)

249033 Dutta, S. N.; Guha, D.; Pradhan, S. N. Department of Pharmacology, Howard University College of Medicine, Washington, D.C. 20059 **Cardiovascular effects of central microinjections of apomorphine in cats.** Archives Internationales de Pharmacodynamie et de Therapie (Ghent). 215(2):259-265, 1975.

A study undertaken to identify a central site or sites for the depressor and bradycardic responses to apomorphine, and to investigate the central neurotransmitter mechanisms involved in its action is reported. Microinjections of apomorphine (25 to 300 micrograms) were made into the lateral ventricle, dorsal nucleus of the vagus, and ventromedial nucleus of the hypothalamus of cats through a stereotactically implanted cannula electrode. It was found that apomorphine caused depressor and bradycardic effects without any dose response relationship. At the above doses of apomorphine, the efferent vagal discharges were markedly increased concurrent with cardiovascular changes. Pretreatment with atropine, scopolamine or haloperidol abolished those responses. Similar results were observed with bivatogony and midcollicular transection. Dopamine (125 to 100micrograms) acetylcholine (10 to 100micrograms) and norepinephrine (25 to 100micrograms) caused similar cardiovascular changes, as in the case of apomorphine, and such effects were blocked by both specific and nonspecific autonomic blockers. Thus the hypothalamus and the dorsal nucleus of the vagus appear to be involved in the central cardiovascular effects of apomorphine, and such effects may be mediated through more than one neurotransmitter mechanism. 14 references. (Author abstract modified)

249036 West, N. R.; Vogel, W. H. Department of Pharmacology, Thomas Jefferson University, Philadelphia, PA 19107 **Absorption, distribution and excretion of trifluoperazine in rats.** Archives Internationales de Pharmacodynamie et de Therapie (Ghent). 25(2):318-335, 1975.

The absorption, distribution, and excretion of trifluoperazine (TFP) and its metabolite, trifluoperazine sulfoxide (TFP-SO), as a function of dose, route of administration, and duration of treatment was studied in the rat. It was found that in rats receiving a low oral dose (0.35mg/kg p.o.) of TFP the parent drug distribution was separate from that of TFP-SO. This was not seen after intraperitoneal administration (i.p.) of the same or a high dose (5mg/kg). TFP-SO was not detected in the brain, whereas TFP was significantly associated with microsomes when its brain level was highest. Absorption, distribution, metabolism, and dose dependent excretion proceeded rapidly with 97% of a dose recovered 24hr after p.o. treatment, only 6% in the urine, and the remainder in

feces with 87% of this metabolized to compounds other than TFP-SO. The excretion pattern was unchanged with other drugs or after treatment for 3wk, although excretion differed on the first day after i.p. and p.o. administration. 31 references. (Author abstract modified)

249074 Kuhar, Michael J.; DeHaven, Robert N.; Yamamura, Henry I.; Rommelspacher, Hans; Simon, Jay R. Department of Pharmacology, Johns Hopkins University School of Medicine, Baltimore, MD 21205 **Further evidence for cholinergic habenulo-interpeduncular neurons: pharmacologic and functional characteristics.** Brain Research (Amsterdam). 97(2):265-275, 1975.

A study was conducted to verify the existence and function of brain cholinergic tracts other than the septal hippocampal pathway. Placement of high frequency lesions in the medial habenular area resulted in a large depletion of acetylcholine (ACh) levels, choline acetyltransferase (ChAc) activity, and high affinity choline uptake in the interpeduncular nucleus area (IPN) at 1, 3 and 7 days postlesion. Areas adjacent to the IPN did not have a reduction in ChAc activity. The reduction in high affinity choline uptake was selective in that there was no change in the uptake of L-(3H)tyrosine or L-(3H)glutamic acid. Unlike the cholinergic septal hippocampal neurons, there was no rise in ACh levels in the IPN 1 hr after placement of lesion, or 30 min after administration of pentobarbital. While the IPN probably has a much denser cholinergic innervation than the hippocampus (as evidenced by much higher ACh levels, ChAc activity and choline uptake levels), it has only one fourth as many (3H)QNB binding sites (a measure of cholinergic muscarinic receptors). It is concluded that some of the habenulo-interpeduncular neurons are probably cholinergic, and that they may have pharmacological and functional differences compared to the septal hippocampal neurons. 28 references. (Author abstract modified)

249078 Trulsson, Michael E.; Jacobs, Barry L. Department of Psychology, Princeton University, Princeton, NJ 08540 **Raphe neurons: depression of activity by L-5-hydroxytryptophan.** Brain Research (Amsterdam). 97(2):350-355, 1975.

Results are summarized of research indicating that 5-hydroxytryptophan (5-HTP), in a dose which elicits a behavioral syndrome mediated by central serotonergic receptors, causes a marked and consistent reduction in midbrain raphe unit activity in the Sprague-Dawley rat. This finding that 5-HTP depresses raphe unit discharge is considered to aid in resolving the controversy concerning the role of systemically administered 5-HTP as a precursor for serotonin in serotonergic neurons. The data reaffirm the viability of L-5-hydroxytryptophan (L-5-HTP) as a tool for basic research on serotonin and for clinical use; it is felt that L-5-HTP may be preferable in cases where researchers are willing to trade its nonspecific effects against its greater efficacy in elevating brain serotonin. 18 references.

249223 Mantilla-Plata, Bernardo; Harbison, Raymond D. Department of Pharmacology, Vanderbilt Medical Center, Nashville, TN 37232 **Distribution studies of (14C)delta-9-tetrahydrocannabinol in mice: effect of vehicle, route of administration, and duration of treatment.** Toxicology and Applied Pharmacology. 34(2):292-300, 1975.

Effects of vehicle, route of administration, and duration of treatment on the absorption, distribution, and excretion of delta-9-tetrahydrocannabinol (THC) in mice were studied. (14C)THC (5mg (20 microCi)/kg) was prepared in 10% Tween 80 and saline (TW) in 5% bovine serum albumin in water

(BSA), in 10% propylene glycol-1% Tween 80 and saline (PPG) or in corn oil (COL). 14C concentration was measured in plasma, liver, brain, lung, and fat tissues. Total radioactivity in all tissues was lowest after po or sc administration, higher after ip, and highest after iv injection. After iv bolus injection, the 14C plasma concentration declined in a biphasic manner. Liver contained and retained the largest amount of 14C. Brain contained significantly less 14C than other tissues. Higher 14C plasma concentrations were seen at 1 hr after THC iv injection in PPG than with TW and BSA. BSA produced lower values than did PPG and TW. However, the 14C lung concentration was 4 times higher with BSA than that in PPG and TW. There were no significant differences in 14C brain concentrations 4 hr after administration of THC in TW, BSA, or PPG. However, TW produced significantly higher 14C brain values 1 hr after THC iv injection. Concentration of 14C in all tissues was significantly lower after THC ip or po administration in COL when compared to those found with TW. There was significantly more 14C excreted in the feces when compared to the amount measured in urine. Repeated iv administration of (14C)THC (5 days) produced high concentrations of 14C in liver, lung, and fat. Brain and plasma concentrations of 14C were lower following repeated administration. 18 references. (Author abstract)

249233 Roffler-Tarlov, Suzanne. Neurology Research, Children's Hospital Medical Center, Boston, MA 02115 **Differences between the effects of acute and long-term treatment with desmethylimipramine on reserpine-induced release of amines from rat brain.** *Biochemical Pharmacology* (Oxford). 24(13-14):1321-1325, 1975.

A study was conducted to determine whether the tricyclic antidepressant desmethylimipramine (DMI) given over long periods has a different intraneuronal action than does acutely administered DMI. A single injection of DMI caused a small, transient and consistent retardation of reserpine induced release of rat brain norepinephrine but not of dopamine and serotonin. In contrast, long-term treatment with desmethylimipramine enhanced the release of rat brain norepinephrine, dopamine and serotonin after reserpine. It was found that the older animals were less sensitive than the younger animals to the brain amine depletion caused by reserpine; however, the interaction between DMI and reserpine was not affected by the age of the animals: the antagonism between acute DMI and reserpine occurred in both young and old rats. The evidence for an intraneuronal site of action of DMI is considered in terms of the mechanism by which the tricyclic antidepressants relieve mental depression. 25 references. (Author abstract modified)

249240 Giedt, W. R., Jr.; Winters, W. D. University of California at Davis, Davis, CA 95616 **Diurnal action of ketamine in the young chick: influence by pineal metabolites.** *Pharmacologist*. 17(2):177, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented which examined the diurnal action of ketamine (Ket) and the influence of serotonin (S), N-acetyl serotonin (NAS) and melatonin (M) on Ket in young chicks. Chicks were maintained on 12 hour light - dark cycles. A 65% increase in action of 60mg/kg Ket was observed at 11 p.m. as compared with that at 11 a.m. Pinelectomy abolished the potentiation of Ket action at 11 p.m. Doses of 4.5mg/kg M, and 36mg/kg NAS, but not 36mg/kg administered 30 min before Ket produced a significant increase in Ket action. These results indicate that a

diurnal rhythm in Ket action exists in the young chick and is abolished by pinelectomy, and that pineal metabolites NAS, and M, but not S, influence Ket action in the young chick. (Author abstract modified)

249242 Hutchison, Michelle Terry; Purdy, Ralph E.; Julien, Robert M. University of California, Irvine, CA 92664 **The contribution of neuronal uptake blockade to the antiepileptic action of carbamazepine (Tegretol).** *Pharmacologist*. 17(2):178, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented seeking to explain the possible mechanism of action of the antiepileptic drug carbamazepine (CBZ). The effects of CBZ on the active neuronal uptake of 3H-norepinephrine (NE) in the in vitro rabbit aorta were examined while concentration of 10(-6) through 10(-5)M (0.2-2.0micrograms/milliliter) showed no significant effect, concentrations of 10(-4)M (20 micrograms/milliliter) decreased the 3H-NE uptake by 20%. CBZ concentrations were confirmed by UV analysis. Therapeutic blood levels of CBZ in man range from 5 to 20 micrograms/milliliter. Imipramine and cocaine (10(-4)M) decreased uptake by 90% (p less than 0.01). This data is consistent with current models of structure/activity relationships for uptake blockade by tricyclic antidepressants. The observed psychotropic activity of CBZ is related to, but much less than, that of cocaine and imipramine. Block of 3H-NE uptake by CBZ may account for this psychotropic effect but does not totally explain the drug's antiepileptic activity. In vitro release and in vivo uptake and release experiments are in progress. (Author abstract modified)

249243 Segal, Jack L.; Cunningham, R. F. Department of Medicine, Emory University School of Medicine, Atlanta, GA 30322 **Studies of methylphenidate-14C in rat brain.** *Pharmacologist*. 17(2):193, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, studies were reported on the entry into and disposition of methylphenidate-14C (M-14C) and its major terminal metabolite ritalinic acid (RA) in rat brain following both i.v. and i.p. dosing. No significant differences in regional uptake were found. Plasma and brain concentration of 14C and M-14C showed a brain/plasma greater than 1. Decline of both brain and plasma concentration of 14C and M-14C followed a two compartment open model. No significant differences in M-14C and 14C could be shown after i.v. or i.p. administration. However, peak levels were lower and were reached later after the i.p. dose. Animals were administered RA-14C. Brain concentrations at different intervals were less than 5% of the corresponding plasma concentrations. This indicates that RA has difficulty in crossing the blood-brain barrier, and that most RA found in brain probably represents the result of hydrolysis. Data suggest that plasma levels of M reflect brain concentrations. (Author abstract modified)

249245 Schneider, P. J.; Dingell, J. V. Department of Pharmacology, Vanderbilt University, School of Medicine, Nashville, TN 37232 **Studies on sulfate conjugation of estrogens in brain and liver.** *Pharmacologist*. 17(2):184, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the sulfate conjugation of estrogens in the brain and liver of guinea pigs and rats. Sulfate conjugates formed by in-

cubation of 17 β -estradiol (E) and diethylstilbestrol (DES) with the soluble fraction of brain or liver and 35S-phosphoadenosine phosphosulfate (PAPS) were separated from PAPS by extraction at pH 6.4 into isoamyl alcohol and assayed by liquid scintillation counting. The conjugate of 14C-E formed by preparations of rat brain and liver was hydrolyzed by arylsulfatase to a product with extraction properties identical to those of the steroid. The following activities (pmol conjugate/mg tissue/20 min, mean values, n=4) were measured with brain preparations. Rat: E, 0.6; DES, 2.0; guinea pig: E, 0.1; DES, 4.1. Activities with guinea pig liver were: E, 98; DES, 333. Thus, with these substrates, the activity of the transferase in brain is only a small fraction of that in liver. Morphine, tetrahydrocannabinol, 7-hydroxychlorpromazine, p-hydroxyamphetamine and bilirubin do not appear to be conjugated with sulfate by these preparations of brain or liver. Moreover, neither morphine nor SKF-525A (1×10^{-4} M) inhibited the conjugation of E by the brain sulfotransferase. (Author abstract modified)

249248 Lewis, V. A.; Gebhart, G. F. Department of Pharmacology, University of Iowa, Iowa City, IA 52242 **The periaqueductal gray and analgesia: further studies of drug and test specificity.** *Pharmacologist*. 17(2):187, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study of the efficacy of various analgesics administered intracerebrally was presented. Sprague-Dawley derived rats were implanted with chronically indwelling 30 G cannulae in the periaqueductal gray matter (5.3mm P to Bregma, 1mm L and 5mm below the dura) and a stimulating electrode in the ipsilateral trigeminal nerve (5.1mm A to Bregma, 1.8mm L and 10.5mm below the dura). The rats were trained to shuttle escape noxious trigeminal nerve stimulation. The effects of 17.5nM morphine SO₄ (M), 175nM chlorpromazine HCl (C), and 52.4nM pentobarbital Na (PB) administered as 0.5microliters intracerebral injections were compared to the effects 5mg/kg M, 5mg/kg C and 10mg/kg Pb administered as equivalent subcutaneous (SC) injections. In addition to trigeminal nerve escape (TG), the drugs were also evaluated in the hot plate and tailflick tests and a forceps pinch squeal test. Only M significantly elevated any of the response thresholds when the drugs were administered intracerebrally. Intracerebral naloxone and xylocaine were also investigated and were without effect on the TG. By the SC route, however, M as well as other agents increased thresholds in these tests. (Author abstract modified)

249249 Buxbaum, Daniel M.; Pamplin, William. Tennessee Neuropsychiatric Institute, Nashville, TN 37232 **Effects of morphine on single unit activity of neurons in the nucleus raphe dorsalis.** *Pharmacologist*. 17(2):187, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented to further define the effect of morphine on serotonin (5HT) mechanisms by investigating the effects of morphine on the spontaneous firing of single neurons in the nucleus raphe dorsalis of rats anesthetized with chloral hydrate. Raphe units had a spontaneous firing rate of 0.5 to 1.5 spikes/sec. Morphine (8mg/kg, i.v.) caused a marked decrease or cessation of neuronal firing. Naloxone pretreatment completely prevented the morphine effects. These data thus provide evidence for a morphine induced effect on 5HT neurons. Although further experiments are essential, these data are compatible with the hypothesis of a negative feedback on raphe firing resulting

from an enhancement of 5HT receptor interactions in the forebrain. However, other explanations could account for the observed effects. (Author abstract modified)

249250 Pirch, James H.; Osterholm, Karen C. Department of Pharmacology and Toxicology, University of Texas Medical Branch, Galveston, TX 77550 **Drug-induced alterations of slow potential responses in the rat.** *Pharmacologist*. 17(2):189, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study of the effects of pentobarbital (PB) and d-amphetamine (d-A) on slow potential responses in rats was presented. Slow potential responses (SPR) were recorded from cerebral cortex of rats with implanted Ag-AgCl electrodes. Negative SPR developed to a conditioned stimulus (5 sec tone) which was followed by food reinforcement. Both PB, 5 to 15mg/kg i.p., and 0.25 to 2mg/kg i.p., depressed SPR in a dose related manner. Depressed SPR occurred after doses of each drug that did not alter food consumption. Combination of appropriate SPR depressant doses of PB and d-A resulted in SPR of control magnitudes, but when the dose of either of the drugs of the combination was increased or decreased, a depressed SPR was observed. Further studies showed that the depression of SPR produced by d-A could be antagonized by chlorpromazine, and that d-A could antagonize reserpine induced depression of SPR. These results are consistent with the concept of an inverted-U relationship between CNS arousal and magnitude of slow potential response. (Author abstract modified)

249251 Slikker, W., Jr.; Riccoboni, F. A.; Gehrmann, J. E.; Killam, K. F. Department of Pharmacology, University of California at Davis, School of Medicine, Davis, CA 95616 **Characterization of EEG effects produced by the interaction of secobarbital with psychomotor stimulants using spectral analysis techniques.** *Pharmacologist*. 17(2):189, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study examining the EEG effects produced by the interaction of secobarbital with various psychomotor stimulants was presented. EEG's were recorded on a multichannel FM tape recorder from epidural electrodes in *M. mulatta* under resting conditions and under the influence of drugs. Serial autospectra were calculated every 4 seconds (2mgm/kg IM), cocaine (4mg/kg IM) and diethylpropion (20mg/kg IM) were studied alone and in combination with secobarbital (15mg/kg IM) and compared with secobarbital alone. The stimulants were found to reduce overall power only slightly whereas secobarbital was found to increase power markedly. The interaction between the stimulants and secobarbital was characterized by a reduction of the usual high frequency seen after secobarbital and by a paradoxical prolongation of other effects of secobarbital. Differences were seen in the spectral envelopes in the interaction studies and may be a means of differentiating underlying neuropharmacological differences in the effects of the stimulants. (Author abstract modified)

249255 Vetulani, J.; Leith, N. J.; Stawarz, R. J.; Sulser, F. Vanderbilt University, School of Medicine, Nashville, TN 37232 **Effect of clonidine on the norepinephrine (NE)-sensitive cyclic AMP generating system in slices of rat spinal cord (SC), brain stem (BS) and limbic forebrain (LFB) and on medial forebrain bundle (MFB) stimulation.** *Pharmacologist*. 17(2):196, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the effects of clonidine on the norepinephrine (NE) - sensitive cyclic AMP system in slices of rat spinal cord (SC), brainstem (BS) limbic forebrain (LFB) and on median forebrain bundle (MFB) stimulation. The central action of clonidine (C) is generally assumed to be the consequence of its mimicking NE at central alpha receptor sites. It was thus of interest to study the effect of C on the NE - sensitive cyclic AMP generating system in brain and on rates of self-stimulation of the MFB. While 5microM NE consistently doubled the basal level of cyclic AMP in SC, BS and LFB, an equimolar concentration of C had little or no effect in BS and LFB but caused a slight increase in the level of the nucleotide in the SC of normal rats and particularly of rats treated with 6-hydroxydopamine. Regardless of the effect of C on the basal level of cyclic AMP, the drug (5 to 50microM) antagonized the stimulatory effect of NE (5microM) in all three areas of the CNS. In MFB self-stimulation, a behavior which is facilitated by intraventricular administration of NE, a dose-dependent depression rather than facilitation occurred following 0.05, 0.1 or 0.2mg/kg of C. It is concluded that C, regardless of its presumptive alpha stimulatory effect, can antagonize NE at central noradrenergic receptor sites. (Author abstract modified)

249257 May, Joan; Sabelli, H. C.; Diamond, B. I. Mt. Sinai Hospital, Chicago, IL 60608 Evidence for alpha, beta and phenylethylaminic adrenergic receptors in isolated frog sciatic nerve. *Pharmacologist*. 17(2):196, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study reporting evidence for the presence of alpha, beta and phenylethylaminic adrenergic receptors in an isolated frog sciatic nerve was presented. Using a 5 - barrel microelectrode system, it was found that the iontophoresis of L-norepinephrine (NE), dopamine or 2-phenylethylamine (PEA) (5 to 20nA, pH5) selectively induced firing or inhibited ongoing activity of some fibers. These experiments, together with others using histamine and acetylcholine, suggest that axonal membranes, not only synapses, are chemically excitable. Addition of NE, L-epinephrine (Epi) or L-isoproterenol (ISO) (3mM) to the Ringer's solution reduced spike amplitude. NE effect was blocked by phentolamine and enhanced by DL-propranolol; ISO effect was enhanced by phentolamine and blocked by DL-propranolol or by replacement by H2O by D2O in the Ringer's solution. Addition of dibutyl cyclic adenosine monophosphate (mM) augmented L-Epi effect. D-Epi (3mM) also lowered spike amplitude but its effect was antagonized by the cyclic nucleotide. D-amphetamine and PEA (10 to 15mM) blocked conduction; L-Epi (but not D-Epi or PEA) prevented conduction block by D-amphetamine, chlorpromazine, etc. (Author abstract modified)

249258 Diamond, B. I.; Sabelli, H. C.; Haydala, H. H. Chicago Medical School, Chicago, IL 60612 Specific axonal effects of a convulsant barbiturate. *Pharmacologist*. 17(2):196, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a paper was presented comparing the specific axonal effects of pentobarbital and phenobarbital. Pentobarbital (PENTO) shares most of the effects of the anticonvulsant phenobarbital (PHENO), however, the effects of these two drugs can be distinguished on isolated

nerves. It was found that the axonal actions of 5-ethyl-(1,3, dimethylbutyl) barbituric acid (DMBB) differed from those of PHENO, PENTO and anesthetics. As other barbiturates, DMBB (2mM) reduced the spike amplitude of isolated frog sciatics, and this effect was increased by lowering pH or (Na). In contrast to PENTO or to procaine, this effect of DMBB was not affected by increasing (Ca). Gamma amino butyric acid (GABA) selectively antagonized DMBB and facilitated spike amplitude lowering by PHENO. The action of DMBB was facilitated by histamine (2mM) and by L-epinephrine (3mM) and it was antagonized by the muscarinic agent bethanechol (2mM) and by dibutyl cyclic adenosine monophosphate (dbcAMP) (1mM). In contrast, PHENO effects were facilitated by dbcAMP and not affected by histamine or L-epinephrine. These specific interactions of convulsant and anticonvulsant barbiturates with inhibitory neurotransmitters such as GABA may be relevant to their in vivo effects. (Author abstract modified)

249263 Sprague, Gary L.; Craigmill, Arthur L. College of Pharmacology, Washington State University, Pullman, WA 99163 Development of cross-tolerance between delta9-tetrahydrocannabinol and ethanol. *Pharmacologist*. 17(2):198, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the development of cross-tolerance between delta9-tetrahydrocannabinol (THC) and ethanol. Drug interaction between THC and ethanol was studied in mice using performance on a rotating rod. Animals chronically treated with equipotent doses of THC or ethanol were tolerant of the acute effects of THC or ethanol suggesting the development of cross-tolerance between the two agents. Acute treatment with propylene glycol (PG) vehicle produced no significant impairment in performance but chronic treatment with this vehicle induced tolerance to the effects of THC. Blood ethanol levels in naive animals after an acute dose of ethanol were not significantly different from animals treated chronically with THC, ethanol, or PG vehicle. Total brain radioactivity in naive animals following an acute dose of 3H-THC did not significantly differ in animals chronically treated with THC, ethanol or PG vehicle. Brain THC metabolite ratios in animals treated 11 days with ethanol or PG vehicle determined using THC differed significantly from ratios in untreated animals. Development of cross-tolerance between THC and ethanol may involve both tissue and metabolic components. (Author abstract modified)

249268 Killam, K. F.; Brocco, M. J.; Weinberger, S. B.; Braude, M. C. Department of Pharmacology, University of California at Davis School of Medicine, Davis, CA 95616 Reversal of residual tolerance to morphine and blockade of effects of morphine with chronic naltrexone administration. *Pharmacologist*. 17(2):206, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study examining the reversal of residual morphine tolerance and blockade of effects of morphine with chronic naltrexone administration was presented. Four former addict M. mulatta were tested over a range of 0.5 to 30mg/kg IM of morphine for evidence of residual tolerance. The animals were placed on 50gamma/kg iv daily of naltrexone for 30 days and reassessed for the response to morphine. Residual tolerance was not apparent at that time. The daily dosage of naltrexone was then established

to block the effects of morphine around the clock. Naltrexone at 1.2mg/kg BID was found to block the effects of challenging doses of morphine up to 30mg/kg. (Author abstract modified)

249273 Howard, J. L.; Pollard, G. T.; Rohrbach, K. W.; Ferris, R. M.; White, H. L. Wellcome Research Laboratories, Research Triangle Park, NC 27709 **Effects of monoamine oxidase inhibitors (MAOI's) on spontaneous and d-amphetamine stimulated locomotor activity.** *Pharmacologist*. 17(2):210, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the effects of monoamine oxidase inhibitors (MAOI's) on spontaneous and d-amphetamine stimulated locomotor activity. MAOI's have been assumed to increase amphetamine stimulated locomotor activity; however, pargyline has been shown to reduce amphetamine's effect. The effects of equivalent doses (defined by measuring MAO inhibition one and two hours after i.p. administration) of ten MAOI's given i.p. just before three hour sessions in circular photocell cages, with amphetamine (1mg/kg) or saline given i.p. before the last two hours were studied. Pargyline (25mg/kg), tranylecypromine (2), isocarboxazid (5), and harmine (50) decreased amphetamine's effect and either did not change or decreased spontaneous activity. Nialamide (100), iproniazid (100), Clorgyline (5), and phenelzine (50) potentiated amphetamine but depressed spontaneous activity. Catron (5) and Deprenil (5) increased amphetamine stimulated and spontaneous activity. Factor and regression analyses revealed complex interactions among synaptosomal uptake and release, amine concentrations, MAOI, and locomotor activity, with spontaneous and amphetamine stimulated activity correlating most closely with uptake and release of norepinephrine and dopamine. (Author abstract modified)

249283 Sanghvi, I.; Gershon, S. New York University Medical Center, New York, NY 10016 **The effect of yohimbine on the turnover of norepinephrine in mice.** *Pharmacologist*. 17(2):227, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study examining the effects of yohimbine on the turnover of norepinephrine (NE) was presented. Yohimbine (YOH), an indole alkaloid, causes excitation in conscious dogs and reduces motor activity in rodents. To understand its opposite behavioral effects in dogs and rodents, its effect on brain NE turnover in mice following chronic administration was investigated. After daily i.p. injections of YOH (10mg/kg) or saline for 8 days, the animals were given alphaMT (200mg/kg, i.p.) and sacrificed at various times. The brain NE levels were determined fluorometrically. YOH caused a small but significant increase in the rate of NE loss, i.e., in the rate of NE synthesis (P less than 0.05). The turnover rates of NE after YOH and saline treatments were 0.052micrograms/g/hr and 0.33micrograms/g/hr, respectively. The data suggest that YOH may increase the synthesis rate by blocking the NE receptors in mouse brain. (Author abstract modified)

249284 Sossi, N.; Dingell, J. V. Department of Pharmacology, Vanderbilt University, School of Medicine, Nashville, TN 37232 **Studies on the glucuronidation of 7-hydroxychlorpromazine in vitro.** *Pharmacologist*. 17(2):232, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a series of in vitro studies

on the glucuronidation of 7-hydroxychlorpromazine were presented. The glucuronide of 7-hydroxychlorpromazine (CPOH), formed by incubation with hepatic microsomes and ¹⁴C-uridine diphosphate glucuronic acid, was isolated by extraction at pH 1 into n-butanol and assayed by liquid scintillation counting. Formation of CPOH glucuronide was confirmed by thin layer chromatography after hydrolysis with beta-glucuronidase. Although concentrations of CPOH greater than 3×10^{-4} M stimulate its conjugation, the apparent K_m of the glucuronyl transferase in microsomal preparations of guinea pig liver for CPOH is about 1×10^{-4} M. Transferase activities (micromole conjugate/g liver/30min, mean values \pm or - S.E. measured with hepatic microsomes were: guinea pig, 1.07 ± 0.07 ($n=11$); rat, 0.39 ± 0.09 ($n=6$). Thus, activity in guinea pig liver is about 3 times that in rat liver; with rat liver microsomes, stimulation of CPOH conjugation by Triton X-100 was about twice that with preparations of guinea pig liver. Using hepatic microsomes from both species, SKF-525A, 1×10^{-4} M inhibited CPOH conjugation 25% but at concentrations greater than 5×10^{-4} M the inhibitory action of SKF-525A decreased, no inhibition was observed at 1×10^{-3} M. Conjugation of estrone by microsomes from guinea pig liver was inhibited over 50% by SKF-525A, 5×10^{-4} M to 1×10^{-3} M. (Author abstract modified)

249286 Palmer, G. C.; Jones, D. J.; Medina, M. A.; Stavinoha, W. B. Department of Pharmacology, University of New Mexico School of Medicine, Albuquerque, NM 87131 **Action of psychoactive drugs on cyclic AMP levels in mouse cerebral cortex and lung following microwave irradiation.** *Pharmacologist*. 17(2):233, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the action of psychoactive drugs on cyclic AMP levels in mouse cerebral cortex and lung following microwave irradiation. A variety of psychoactive compounds were ingested in mice and after specified time periods, subsequent cyclic AMP levels were measured in rapidly fixed (0.3sec of 5 KW microwave irradiation) cerebral cortex and lung. Drugs which increased cyclic AMP in the cerebral cortex were: amitriptyline (20mg/kg); chlorpromazine (12.5mg/kg); chlorpromazine sulfoxide (25mg/kg); papaverine (150mg/kg); caffeine (100mg/kg); and pargyline (75mg/kg). Alpha methyl p-tyrosine (250mg/kg) displayed a transient effect on both cerebral and lung tissue. At first, levels of the nucleotide were increased and later were decreased. In the lung the following compounds elevated cyclic AMP: chlorpromazine; chlorpromazine sulfoxide; amitriptyline; papaverine; and reserpine (2.5mg/kg/day). Agents inhibiting cyclic nucleotide accumulation in the lung were: amphetamine (8mg/kg); (8mg/kg); LSD (2micrograms); caffeine; and papaverine. (Author abstract modified)

249287 Levin, Robert M.; Weiss, Benjamin. Department of Pharmacology, Medical College of Pennsylvania, Philadelphia, PA 19129 **On the mechanism of the inhibition of brain cyclic AMP phosphodiesterase by psychotropic agents.** *Pharmacologist*. 17(2):233, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the mechanism of the inhibition of brain cyclic AMP phosphodiesterase (PD) by psychotropic agents. Earlier studies showed that trifluoperazine (TFP) preferentially inhibited the activation of PD. The present study was designed

to determine whether other psychotropic agents share this property and the mechanism of this inhibition. The activation of purified PD of bovine brain was inhibited by the psychotropic agents, TFP (150=10microM); chlorpromazine (CPZ) (42microM); benperidol (58microM); chlorprothixene (16microM); pimoide (7microM) and medazepam (150microM) as well as by EGTA. Structurally related agents devoid of psychotropic activity had relatively little effect in inhibiting the activated PD of brain. The EGTA induced inhibition of PD activation was overcome by increasing calcium but not by increasing activator. The CPZ induced inhibition, on the other hand, was unaffected by increasing calcium but was competitively antagonized by high activator concentrations as shown by kinetic analysis. These results suggest that several psychotropic agents having diverse chemical structures have the common property of specifically inhibiting the activated form of PD in brain by competing with the activator for the PD. (Author abstract modified)

249290 Weinberger, S. B.; Brocco, M. J.; Killam, K. F.; Braude, M. C. Department of Pharmacology, University of California (Davis) School of Medicine, Davis, CA 95616 **Studies with 1-alpha acetyl methadol: 1. tolerance in M. mulatta.** Pharmacologist. 17(2):237, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study to develop a model tolerance state for opiates and opioids for the evaluation of 1-alpha acetyl methadol (LAAM) used in methadone maintenance programs was presented. To model this state, former addict monkeys were administered LAAM parenterally and daily over a 3 month period. The degree of tolerance produced was evaluated by the severity of the abstinence syndrome induced by naloxone, the response to increments of LAAM, and the responses to large doses of morphine. It was necessary to increment the dose of LAAM slowly and hold the animals at each dose level for ten days or more from 1mg/kg i.v. or i.m. (Author abstract modified)

249291 Sparber, S. B.; Lydiard, R. B.; Gellert, V. University of Minnesota, Minneapolis, MN 55455 **Tyrosine hydroxylase activity is lower in forebrain during naloxone precipitated withdrawal in morphine pelleted rats.** Pharmacologist. 17(2):237, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a study examining tyrosine hydroxylase (TH) activity in forebrain during naloxone precipitated withdrawal in morphine pelleted rats was presented. To separate the effects of subacute stress from the primary consequences of withdrawal, 1mg naloxone/kg or saline was administered to pelleted rats (75mg, 3 days). While TH activity 1.5hr later in hindbrain was not different, a significant (25%) reduction in activity was observed in the forebrains of dependent rats in withdrawal. Morphine dependent/tolerant rats' TH activity was not different from that of placebo implanted rats administered Nx. (Author abstract modified)

249292 Tzeng, S. F.; Ho, I. K. Department of Pharmacology and Toxicology, University of Mississippi Medical Center, Jackson, MS 39216 **Effect of acute and chronic morphine administration on brain glutamate (Glu) and gamma-aminobutyrate (GABA) levels in the mouse.** Pharmacologist. 17(2):238, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975

at the University of California, Davis, a study was presented examining the effect of acute and chronic morphine administration on brain glutamate (Glu) and gamma-aminobutyrate (GABA) levels in the mouse. In male ICR mice receiving a s.c. administration of morphine sulfate (30mg/kg), brain levels of Glu were significantly lower than those of the control group, being 10% and 15% at 30 min and 60 min, respectively. On the other hand, the brain levels of GABA in the morphine treated group at 30 min and 60 min were 11% and 20% higher than those of the control. To monitor both Glu and GABA levels during morphine tolerance development, animals were rendered tolerant by implanting a specially formulated 75mg morphine pellet at various time intervals. At 8 hr after morphine pellet implantation, the Glu level was 8% higher; the GABA level was not significantly different from that of the control. However, both 24 hr and 72 hr after the morphine pellet implant, GABA levels were 10% lower than that of the control. After abrupt withdrawal from morphine, the GABA level was further decreased in comparison to the group in which pellets were not removed. The data confirm previous findings that the inhibitory neurotransmitter GABA is involved in morphine analgesia, tolerance and physical dependence. (Author abstract modified)

249293 Darden, J.; Hunt, W. Armed Forces Radiobiology Research Institute, Bethesda, MD 20014 **Depression of dopamine release during the ethanol withdrawal syndrome.** Pharmacologist. 17(2):240, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the depression of dopamine (DA) release observed in ethanol withdrawal syndrome in rats. To determine whether this finding reflects a reduction in the rate of dopamine release, this parameter was measured in ethanol (ETOH) dependent rats and under other conditions of ETOH treatment. Male Sprague-Dawley rats were rendered ETOH dependent by the method of Majchrowicz. DA release in the caudate nucleus was determined by the rate of release of 3H-DA from prelabeled slices in the presence and absence of K+. During the ETOH WDRS both K+ induced and nonstimulated DA release were significantly depressed, remaining so for 7 days after WDR. When the ETOH dependent rats were still intoxicated, K+ stimulated DA release was enhanced. In naive animals which were severely intoxicated from a single dose of ETOH (6gm/kg, p.o.), both types of release were reduced. As the animals recovered, K+ stimulated release became elevated, then both returned to control levels. Data suggest that the increased DA release is due to the direct effects of ETOH on the brain, while the reduced release in ETOH dependent rats reflects some aspect of chronic ETOH treatment and may be involved in the expression of some of the symptoms of the ethanol withdrawal syndrome. (Author abstract modified)

249294 Suran, Anita A. Howard University College of Medicine, Washington, DC 20059 **Chronic ethanol feeding and brain adenylyl cyclase and phosphodiesterase levels in mice.** Pharmacologist. 17(2):240, 1975.

At the Fall meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study examining the effect of chronic ethanol feeding on brain adenylyl cyclase and phosphodiesterase levels in mice was presented. Regional distributions of brain soluble phosphodiesterase (PDE) and particulate adenylyl cyclase (AC) activities were measured in 8 re-

gions of brains from 3 inbred mouse strains differing in responses to ethanol (ETOH). After 3 weeks, brains from C57BL, DBA and BALB/c mice fed ETOH and controls fed water were analyzed by pairs; no significant differences were found for PDE. Means for AC from both groups were close, whether assays were done in the presence or absence of sodium fluoride (NaF). Published reports indicate that with chronic ETOH, PDE remains constant and that AC in ETOH fed Swiss mouse cortex is significantly higher than controls, only if measured in the absence of NaF. It remains to be determined if results differ because of animal strain, experimental design or assay methods. (Author abstract modified)

249295 Speth, R. C.; Dettbarn, W. -D.; Schmidt, D. E. Vanderbilt University, Nashville, TN 37232 **Cholinesterase (ChE) inhibition and synaptosomal acetylcholine (ACh) synthesis and release following in vivo paraoxon (Px) administration.** Pharmacologist. 17(2):246, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a study examining cholinesterase (ChE) inhibition and synaptosomal acetylcholine (ACh) synthesis and release following paraoxon (Px) administration was presented. Doses of Px, adjusted to produce whole body tremors, were given s.c. to rats, either as a single dose (approximately 0.22mg/kg) or daily for 5 days (dosage decreased by approximately 0.03mg/kg/day). Thirty min after acute Px, brain (excluding brainstem and cerebellum) ChE activity was 96.4% inhibited. Spontaneous (4 MMK+) and stimulated (31 MMK+) ACh release from synaptosomes were increased by 52% and 39% respectively, compared to non Px treated controls, and the rate of synaptosomal ACh synthesis was also increased by 33% and 70%, respectively. Thirty min after chronic Px, ChE activity was still strongly inhibited (96.3%). However, both spontaneous and stimulated ACh release, though slightly increased (21% and 17% respectively), were not significantly different from non Px treated controls. Similarly, ACh synthesis had returned to near control values. Results suggest that cholinergic neurons in brain become tolerant to the ACh releasing effects of Px. This effect may be related to the adaptation of other physiological parameters seen following chronic Px administration. (Author abstract modified)

249297 Cerreta, K. V.; Flynn, E. J. Department of Pharmacology, CMDNJ, New Jersey Medical School, Newark, NJ 07103 **Barbiturate response in immunized mice.** Pharmacologist. 17(2):251, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a study was presented which examined barbiturate response in immunized mice. Mice were actively immunized using a barbiturate bovine gamma globulin conjugate as the antigen. The immunization schedule developed elicits antibody production in mice, and sera from these animals bind 3H-phenobarbital in vitro while controls do not. The disposition of 3H-phenobarbital (1microC, i.v.) vs time in actively immunized mice and controls was compared and found to be altered. There is a threefold increase in the amount of phenobarbital present in the serum of actively immunized mice compared to controls. The increase in barbiturate level is due to the presence of gamma globulin. Similarly, passively immunized mice showed an altered disposition of 3H-phenobarbital; the increased serum levels again result from a circulating gamma globulin fraction. The pharmacologic response to barbiturate in actively immunized mice and con-

trols was investigated using a rotorod technique for monitoring ataxia. The response to pentobarbital in actively immunized mice was decreased. (Author abstract modified)

249298 Carson, Virginia G.; Jenden, Donald J. Department of Pharmacology, University of California at Los Angeles, Los Angeles, CA 90024 **Effect of labelled acetylcholine (AcCh) uptake by rat brain slices on endogenous levels of AcCh and choline (Ch).** Pharmacologist. 17(2):254, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a study was presented examining the effects of pentobarbital on acetylcholine released from different regions of rat brain. The pentobarbital induced increase in brain levels of acetylcholine (ACh) might be attributed to an inhibition of ACh release by the drug, and to test this possibility, the increase in brain ACh and the inhibition of ACh release were compared in different regions of rat brain. Sodium pentobarbital (50mg/kg, i.p.) increased ACh levels in the hippocampus and cerebral cortex, to a lesser degree in the striatum and not at all in the midbrain and the pons medulla. A superfusion system was used to examine the release of ACh in vitro from prisms prepared from the different brain regions. ACh released from all regions by 50mM KCl reached an early peak and then declined with time. The amount of ACh released by KCl from the regions varied in the order: striatum is greater than hippocampus is greater than cerebral cortex is approximately equal to midbrain is approximately equal to pons medulla. Pentobarbital (5 x 10⁻⁴M) almost totally inhibited the release from all regions except the striatum, where the inhibition was 55%. Thus, the increase in brain levels of ACh by pentobarbital is not correlated with the ability of the drug to block ACh release. (Author abstract modified)

249299 Cosgrove, K. A.; Scudder, C. L.; Karczmar, A. G.; Kindel, G. H. Department of Pharmacology, Loyola University Medical Center, Maywood, IL 60153 **Acetylcholine levels and turnover in brains of lithium treated and stressed mice.** Pharmacologist. 17(2):255, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August, 1975 at the University of California, Davis, a study was presented examining acetylcholine levels and turnover in brains of lithium treated and stressed rats. Effects of footshock (1 shock/min, total of 30 shocks) and lithium (5meq/kg) on acetylcholine (ACh) and choline (Ch) levels and ACh turnover were examined in male CF-1 mice. Levels were evaluated by the enzymatic radioassay method turnover by that of Jenden et al. Footshock decreased ACh levels in whole brain and in brain parts and increased ACh turnover by 20%. Lithium increased ACh levels and turnover by 45% and 74%, respectively. ACh levels did not change from controls following combined lithium and shock treatment. Shock did not augment the turnover effect of lithium as ACh turnover was increased by 67% following combined lithium and shock treatment. (Author abstract modified)

249300 Schmidt, Dennis E. Vanderbilt University, Nashville, TN 37232 **Effect of d-amphetamine and d,l-parachloroamphetamine on regional levels of choline and acetylcholine in rat brain.** Pharmacologist. 17(2):255, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a study was presented examining the effect of d-amphetamine (AMP) and d,l-

parachloroamphetamine (PCA) on regional levels of choline and acetylcholine (ACh) in rat brain. Rats were sacrificed by 2 sec head focused microwave irradiation. Both PCA (5mg/kg, i.p.) and AMP (2.5mg/kg, i.p.) induced short-term (less than 48 hours) increases in ACh levels in striatum (ST) and cerebellum (CE) and simultaneous decreases in ACh levels in hippocampus (HI) and cortex (CX). In addition, PCA caused a long-term (greater than 48 hrs) increase in ACh levels in ST and CE. PCA also induced an increase in choline levels in all areas except CX at 4 hrs, and which lasted for 24 hrs in the ST and HI. AMP caused a 4 hr increase in choline levels in ST. It is suggested that the short-term changes in ACh levels induced by both PCA and AMP may be mediated via release of dopamine, while the long-term changes caused by PCA are related to its serotonergic (5HT) effects and indicate that 5HT may be involved in regulation of ACh in the ST. It is considered unlikely that the changes observed in choline levels are functionally related to changes in ACh levels. (Author abstract modified)

249301 Yamamura, Henry I.; Snyder, Solomon H. Department of Pharmacology, Arizona Medical Center, Tucson, AZ 85724 **Tricyclic antidepressants and the central cholinergic muscarinic receptor.** *Pharmacologist* 17(2):255, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a paper was presented examining the interaction of tricyclic antidepressants and the central cholinergic muscarinic receptor. Several tricyclic antidepressants were assessed for their potency in binding to the cholinergic muscarinic receptor of brain. Amitriptyline is about ten times as potent as imipramine. Dimethylated drugs are more potent than monomethylated ones. The relative anticholinergic activities of tricyclic antidepressants have implications for their use in patients who might be affected adversely by anticholinergic effects. Moreover, a variety of evidence linking cholinergic neuronal functioning to affective disorders, together with the relative affinities of tricyclic drugs for the cholinergic muscarinic receptor, may have relevance to the differential antidepressant actions of drugs. Specifically, drugs with central anticholinergic actions in addition to their ability to inhibit biogenic amine uptake might be more efficacious antidepressants than drugs with less anticholinergic propensities. (Author abstract modified)

249303 Simon, Jay R.; Kuhar, Michael J. Johns Hopkins University School of Medicine, Baltimore, MD 21205 **Sodium-dependent high affinity choline uptake as a regulatory step in acetylcholine synthesis.** *Pharmacologist* 17(2):255, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a study was presented which examined sodium dependent affinity choline uptake as a regulatory step in acetylcholine (ACh) synthesis. The finding that acetylcholine synthesis is coupled to neuronal activity suggests the presence of a regulatory step in this process. An examination was made of the effects of altering impulse flow in the septal/hippocampal pathway on the sodium dependent high affinity choline uptake (SDHACU) in hippocampal synaptosomes. When impulse flow was reduced by the administration of pentobarbital (PB: 65mg/kg), chloral hydrate (40mg/kg), gammabutyrolactone (750mg/kg), or by placement of acute septal lesion (60 min), SDHACU was reduced 50% to 80%. Restoration of impulses by electrical stimulation of the septum in PB treated rats reversed the depression of SDHACU. Administration of pentylenetetrazol (75mg/kg), a convulsant, in-

creased SDHACU 50%, and this increase was prevented by acute septal lesion. Administration of scopolamine (5mg/kg), which increases ACh turnover, and oxotremorine (1mg/kg) which decreases ACh turnover, increased and decreased SDHACU respectively. Kinetic analysis of the uptake revealed that the changes occurred in the V_{max} of the transport system. None of these drugs had any effect on SDHACU when added directly to samples in vitro. These experiments provide direct evidence that SDHACU is linked to impulse flow and could be the major regulatory step in the synthesis of ACh. (Author abstract modified)

249304 Bernard, P.; Edwards, S. J.; Fielding, S.; Robson, R. D.; Saelens, J. K.; Simke, J. P.; Welch, J. Research Department, Pharmaceuticals Division, CIBA-GEIGY Corporation, Summit, NJ 07901 **Baclofen (Bf): an unusual CNS-active agent.** *Pharmacologist* 17(2):256, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a study examining the effects of the CNS active agent baclofen (Bf) was presented. Frederiksen recently described an antipsychotic effect of Bf in chronic schizophrenics. In animals Bf caused blockade of avoidance in rats (5.0mg/kg i.p.) and monkeys (2.5mg/kg p.o.) which could not be reversed by benztrapine. Self-stimulation in rats was blocked at 5 to 10mg/kg i.p. Bf. In single unit activity studies in rats Bf, 4 to 8mg/kg i.v., markedly depressed the firing rate of A10 dopaminergic neurons which could not be reversed by fluphenazine. d-Amphetamine blockade of A10 neurons was not affected by Bf, but Bf prevented the usual reversal of d-amphetamine by fluphenazine. A d-amphetamine blocked, fluphenazine reversed A10 neuron, could again be blocked by Bf. The dopamine (DA) levels in the mesolimbic area of rats were not significantly altered by 15 to 20mg/kg i.p. Bf although there was a trend toward lower levels. Bf did not alter the rate of loss of DA after 400mg/kg i.p. alpha-methyl-p-tyrosine but markedly depressed the levels of dihydroxyphenyl neutral metabolites of DA. These results suggest that the antipsychotic activity of Bf may be related to its ability to suppress the firing rate and function of dopaminergic neurons in the mesolimbic system. (Author abstract modified)

249307 Marcus, Robert J.; Villablanca, Jaime. Department of Psychiatry, Mental Retardation Research Center, NPI, University of California, Los Angeles, CA 90024 **Effects of alpha-methyl-p-tyrosine (AMPT) on the electroencephalogram (EEG) of the "cervical isole" and sleep of the chronic mesencephalic cat.** *Pharmacologist* 17(2):257, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held August 1975 at the University of California, Davis, a study was presented which examined the effects of alpha-methyl-p-tyrosine (AMPT) on the electroencephalogram (EEG) of the cervical isole and sleep of the chronic mesencephalic cat. Jouvett postulated that the tonic EEG desynchrony in the chronic cervical isole is mediated by lower brainstem catecholamines and suggested that this be tested by the administration of AMPT; a suppression of desynchrony would validate his hypothesis. He also postulated that catecholamines are involved in rapid eye movement sleep (REMs). To test the above, 3 chronic cats with high mesencephalic transection were used. Seven experiments were done following i.p. administration of AMPT, 50-200 mg/kg; the higher doses are reported to effectively lower norepinephrine in all brain regions except the hypothalamus. EEG as well as REMs were monitored 8 hours prior to and following AMPT. In all cats, EEG desynchrony was observed

which was equal or greater in amount than that observed before the drug. The amount of REMs markedly increased. This indicates the EEG desynchrony (and REMs) in the mesencephalic transected cat is not likely mediated by a brainstem catecholaminergic mechanism, thus strengthening the postulate of an autochthonous forebrain arousal system. (Author abstract modified)

249308 Ferris, R. M.; Howard, J. L.; White, H. L. Wellcome Research Laboratories, Research Triangle Park, NC 27709 A relationship between clinical efficacy and various biochemical parameters of monoamine oxidase inhibitors (MAOI's). *Pharmacologist*. 17(2):257, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975 at the University of California, Davis, a study was presented examining the relationship between clinical and various biochemical parameters of monoamine oxidase inhibitors (MAOI's). It has been proposed that the clinical efficacy of MAOI's is due to their effect on inhibition of norepinephrine (NE) uptake, rather than MAO inhibition. Synaptosomal uptake and release of amines in vitro, brain amine concentrations and MAO inhibition, using serotonin and phenylethylamine as substrates, were measured following i.p. administration of ten MAOI's. Concentrations of the compounds necessary to cause 50% inhibition (IC50) of NE uptake were 9.7×10^{-7} for tranylcypromine, 1.9×10^{-6} for pheniprazine and 4.4×10^{-6} for phenelzine. Pargyline, nialamide, iproniazid and isocarboxazid were ineffective at 10^{-5} M. The IC50 for dopamine (DA) uptake were closely related to those for NE uptake, and none of the compounds inhibited serotonin uptake. Tranylcypromine and pheniprazine facilitated DA release. Significant correlations existed between clinical efficacy and inhibition of NE uptake ($r = +.96$) and DA uptake ($r = +.83$), and stimulation of DA release ($r = +.92$). Although these results do not rule out a role for MAO inhibition in antidepressant action, they do suggest the importance of inhibition of uptake and facilitation of release. (Author abstract modified)

249309 Vazquez, A. J.; Borison, R.; May, J.; Sabelli, H. C. Chicago Medical School, Chicago, IL 60612 Evidence for 2-phenylethylamine (PEA) as a mediator for the central stimulant and anti-tremorgenic actions of delta9-tetrahydrocannabinol (THC). *Pharmacologist*. 17(2):258, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975 at the University of California, Davis, a study was presented which advanced evidence for the existence of 2-phenylethylamine (PEA) as a mediator for the central stimulant and antitremorgenic actions of delta9-tetrahydrocannabinol (THC). THC augments: 1) excitatory effects of microiontophoretic PEA upon cortical unit firing; 2) recovery of intraventricular 14C-PEA; 3) brain levels of PEA. PEA induces brief stimulation followed by sedation in untreated and marked stimulation and choreic like movements in mice pretreated with THC or monoamine oxidase inhibitors (MAOI). THC induces sedation in untreated mice, stimulation and choreic like movements in mice pretreated with MAOI, and antagonizes oxotremorine induced tremors. Rabbit brain PEA content (gas liquid chromatography) is increased fourfold 1 hour after THC (3mg/kg). Experiments on metabolic disposition of intraventricularly injected 14C-PEA in rabbits suggest that THC inhibits the conversion of PEA to a major unidentified metabolite. The euphoriant and central antitremorgenic effects of THC may be partially mediated by an increase in brain PEA whereas its sedative effects may depend on the formation of its deaminated metabolites. (Author abstract modified)

249310 Borison, R.; Sabelli, H. C.; Ho, B. Chicago Medical School, Chicago, IL 60612 Influence of a peripheral monoamine oxidase inhibitor (MAOI) upon the central nervous system levels and pharmacological effects of 2-phenylethylamine (PEA). *Pharmacologist*. 17(2):258, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975, at the University of California, Davis, a study was presented examining the influence of a peripheral monoamine oxidase inhibitor (MAOI) on the central nervous system levels and pharmacological effects of 2-phenylethylamine (PEA). Dimethyl-beta-carbolinium iodide (DMCI) is a MAOI which does not cross the blood/brain barrier. Using gas-liquid chromatography, it was found that endogenous rabbit brain PEA content (0.35 ± 0.04 ng/g) was tripled to 1.11 ± 0.06 ng/g one hour after the administration of DMCI (15mg/kg). In mice pretreated with pargyline (100 mg/kg, 24 hour prior), a peripheral and central MAOI, PEA (20mg/kg) induced amphetamine like behavioral stimulation and partially prevented maximal electroshock seizures. When DMCI (50mg/kg, 24 hr prior) was administered alone or in combination with PEA (20mg/kg), it failed to alter behavior or maximal electroshock seizures, but potentiated the behavioral and anticonvulsant effects induced by PEA plus pargyline. This evidence, coupled with the depletion of brain PEA produced by L-alpha alpha-methyl-dopa hydrazine, a peripheral decarboxylase inhibitor and the studies by Snodgrass using labeled L-phenylalanine, indicate that brain PEA is mostly of peripheral origin. (Author abstract modified)

249311 Sabelli, H. C.; Borison, R. L. Chicago Medical School, Chicago, IL 60612 Catecholamines and 2-phenylethylamine (PEA) in the central and peripheral actions of amphetamines. *Pharmacologist*. 17(2):258, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975 at the University of California, Davis, a study was presented which examined catecholamines and 2-phenylethylamine (PEA) in the central and peripheral actions of amphetamines. Behavioral, electrophysiological and biochemical studies indicate that release of endogenous PEA contributes to central stimulation by amphetamines. In mice, the stimulant and anticonvulsant (electroshock) effects of delta-amphetamine are prevented by inhibition of catecholamine synthesis with alpha-methyl-tyrosine (which does not deplete PEA) and by inhibition of decarboxylation with N1-(DL-seryl)-N2-(2,3,4-trihydroxybenzyl)-hydrazine (R04-4602) (at a dose which can inhibit PEA synthesis but below that needed for depletion of brain PEA). Neither alpha-methyl-p-tyrosine nor R04-4602 prevented the stimulant and anticonvulsant effects of PEA (plus pargyline). As in brain, delta-amphetamine (0.5mg/kg) halves PEA content of the rabbit heart, whereas L-AMPH slightly reduces it. In comparison to catecholamines, PEA is more potent as a behavioral stimulant and exerts weaker cardiovascular effects. Thus, the ability of D-AMPH to release both catecholamines and PEA, and L-AMPH to release mainly catecholamines may account for the differences between D-AMPH and L-AMPH in their behavioral, neurological and cardiovascular effects. (Author abstract modified)

249313 Lippmann, W.; Pugsley, T. Ayerst Research Laboratories, Montreal, Quebec, Canada H3C 3J1 Effects of pirandamine (PA) and tandamine (TA), potential antidepressants, on the uptake of norepinephrine (NE) and 5-hydroxytryptamine (5-HT) and related activities. *Pharmacologist*. 17(2):258, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975, at the

University of California, Davis, a study examining the effects of pirandamine (PA) and tandamine (TA), potential antidepressants on the uptake of norepinephrine (NE) and 5-hydroxytryptamine (5-HT) and related activities was presented. TA blocked the uptake of intravenous 3H-NE in mouse heart of intraventricular 3H-NE in rat medulla and H77/77 depletion of rat brain NE; PA was ineffective in blocking each. PA blocked mouse brain 5-HT uptake, potentiated the 5-HTP behavioral syndrome in mice and 5-HT dependent extensor reflex in rats; TA, like desimipramine (DMI), blocked 5-HT uptake weakly, but unlike DM, potentiated the reflex. Neither agent, like imipramine, exhibited any appreciable *in vivo* MAO inhibition in mice. Both agents, like DMI, I and A, potentiated the L-Dopa behavioral syndrome. TA antagonized reserpine hypothermia and reserpine ptosis and potentiated apomorphine gnawing. PA was not appreciably effective. Both agents antagonized oxotremorine hypothermia but not the tremors indicating lack of central anticholinergic effect; DMI, I and A antagonized both effects. These findings indicate PA is a relatively specific blocker of 5-HT uptake and TA of NE uptake. (Author abstract modified)

249315 Tseng, Liang-fu. Department of Pharmacology, University of California, San Francisco, CA 94143 **Comparison of the monomethoxyamphetamines on the uptake and release of biogenic amines in brain tissue.** *Pharmacologist*. 17(2):259, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975 at the University of California, Davis, a study was presented which compared the monomethoxyamphetamines on the uptake and release of biogenic amines in brain tissue. Para-methoxyamphetamine (PMA) is the most potent compound among monomethoxyamphetamines in disrupting food reinforced behavior in rats. Meta-methoxyamphetamine (MMA) produces moderate d-amphetamine (A) like locomotor stimulation but ortho-methoxyamphetamine (OMA) is not active. A comparison was made on the uptake and spontaneous release of 3H-5HT, 3H-NE and 3H-DA in tissue slices of cerebral cortex and corpus striatum of rat brain. The potencies for inhibiting the uptake of 3H-5HT in cerebral cortex and corpus striatum were PMA is greater than MMA is greater than A is greater than OMA and of 3H-NE in cerebral cortex A is greater than PMA is greater than MMA is greater than OMA and of 3H-DA in corpus striatum A is greater than MMA is greater than PMA is greater than OMA. The potencies for the increased release of 3H-5HT in cerebral cortex was found to be PMA is greater than MMA is greater than A is greater than OMA and of 3H-NE, A is greater than PMA = MMA is greater than OMA and of 3H-DA in corpus striatum, A is greater than MMA is greater than PMA is greater than OMA. The high effectiveness of PMA in increasing the release and blocking the uptake of 5HT and of A and MMA on DA suggests that 5HT may be involved in the production of hallucinogenic effects of PMA and DA is important in the locomotor stimulation of A and MMA. (Author abstract modified)

249316 Brase, David A.; Loh, Horace H. Department of Pharmacology, University of California, San Francisco, CA 94143 **Correlation of the increase in brain tryptophan produced by amphetamine-like drugs with an increase in body temperature.** *Pharmacologist*. 17(2):259, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975, at the University of California, Davis, a study was presented correlating the increase in brain tryptophan produced by amphetamine like drugs with an increase in body temperature.

Two effects of amphetamine (A), hyperthermia and increased serum unesterified fatty acids (UFA), were considered as having possible roles in the A-induced increase in brain levels of tryptophan (Trp). Male Sprague-Dawley rats received i.p. injections of 50micromoles/kg of the following: d1-A, d1-beta, betata-difluoroA (DFA), d1-p-hydroxyA (PHA), d1-p-methoxyA (PMA), d1-p-chloroA (PCA), methA (MA), benzphetamine (BP) methylphenidate (MP), or train Trp compared to saline injected control rats were measured at 1 hour. All drugs significantly increased UFA except MP. Effects on temperature and Trp were more variable. Concerning increases in Trp, the drugs ranked in order of decreasing effect: A, PMA, MA, PCA, MP, PHA, DFA, CP and BP. For temperature increase the rank was A, MA, PCA, DFA, PMA, MP, PHA, CP and BP. The change in brain Trp was highly correlated with changes in body temperature ($r=0.89$) but not with changes in serum UFA ($r=0.04$). Also, changes in temperature did not correlate with UFA changes ($r=0.01$). The A induced increase in brain Trp also appeared to correlate with temperature increases in several mouse strains. The mechanism by which hyperthermia increases Trp is unknown. (Author abstract modified)

249318 Glennon, Richard A.; Gessner, Peter K. Department of Pharmacology, State University of New York at Buffalo, Buffalo, NY 14214 **Correlations between the activity of dimethyltryptamines as 5-hydroxytryptamine antagonists and their quantum chemical parameters.** *Pharmacologist*. 17(2):259, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975 at the University of California, Davis, a study was presented which examined correlations between the activity of dimethyltryptamines as 5-hydroxytryptamine antagonists and their quantum chemical parameters. A number of N-dimethyltryptamines (DMTs) possess hallucinogenic activity. It was of interest therefore to determine how these properties correlate with their quantum chemical parameters and their activity as 5-hydroxytryptamine (5HT) antagonists in a model system. The system used was the rat stomach fundus preparation. Previous work showed DMTs act on two receptors in the rat stomach fundus: the 5HT receptor and a phenoxybenzamine resistant tryptamine (PRT) receptor, the net outcome being a contraction. In the present work the apparent intrinsic activity of the DMTs for the 5HT receptor in the rat stomach fundus was determined by obtaining dose response curves for 5HT in the presence of various bath concentrations of the DMTs and calculation therefrom pA2 values. Of the compounds investigated bufotenine had the highest pA2 (7.41) followed by 5-methoxy-N-dimethyltryptamine (7.10). N-Dimethyltryptamine's pA2 was 6.00. Electrophilic frontier electron densities were calculated using a PPP-SCF molecular orbital method. A correlation of .961 ($N=8$) was found between the pA2 values and the electrophilic frontier electron density at position 4. (Author abstract modified)

249418 Adams, M. D.; Chait, L. D.; Earnhardt, J. T. Department of Pharmacology, Health Sciences Division, Medical College of Virginia, Virginia Commonwealth University, Richmond, VA 23298 **Tolerance to the cardiovascular effects of delta9-tetrahydrocannabinol in the rat.** *British Journal of Pharmacology* (London). 56(1):43-48, 1976.

A study examining the effects of pretreatment with delta9-tetrahydrocannabinol (delta9-THC) on tolerance to the pressor, depressor, and negative chronotropic effects of intravenously administered dosage of the drug in normotensive rats is

discussed. The findings clearly demonstrate that tolerance develops to the hypotensive and negative chronotropic effects in rats previous shown to be tolerant to the bodyweight and hypothermic effects of the compound. However, there was no tolerance to the transient pressor activity. The hypothermia, reduced growth rate, hypotension and bradycardia produced by the compound (10mg/kg, i.p. per day) were considered manifestations of central nervous system actions by other investigators, while earlier research suggested that the pressor response is a peripheral vascular effect. It is concluded that while tolerance to actions of delta-9-THC in the CNS can readily be demonstrated, there is no tolerance to what appears to be a peripheral effect of the compound. This is seen as analogous to the absence of tolerance to the effects of morphine on intestinal smooth muscle at a time when tolerance to the CNS effects of the narcotic can easily be demonstrated. 24 references.

249459 Clark, R.; Smith, D. H.; Vernier, V. G. Pharmaceuticals Division, Biochemicals Department, E.I. de Pont de Nemours & Co., Inc., Stine Laboratory, Newark, DE 19711 **Amantadine decreases d-amphetamine stimulation and increases d-amphetamine anorexia in mice.** Proceedings of the Society for Experimental Biology and Medicine. 151(2):434-436, 1976.

The effects of amantadine hydrochloride (Symmetrel), an antiviral, antiparkinsonian agent that is most frequently used clinically at oral doses of 2mg/kg to 3mg/kg, are tested in female mice. The available evidence from animal experiments pointing to amantadine hydrochloride's interaction with dopamine and perhaps other catecholamines within the brain as its major mode of action was confirmed, and other new actions were revealed. It was observed that amantadine hydrochloride significantly decreased delta-amphetamine induced CNS stimulation (motor activity) and simultaneously increased delta amphetamine induced anorexia (milk intake) in the mice. It was found that amantadine did this at oral doses of 2.5mg/kg and 5mg/kg, which alone had no effect on either motor activity or milk intake. 9 references.

249484 Teitelbaum, H.; Blosser, J.; Catravas, G. Departments of Behavioral Sciences and Neurobiology, Armed Forces Radiobiology Research Institute, Bethesda, Maryland 20014 **Bilateral electroencephalographic response and unilateral tolerance to unilateral intracerebral morphine injections.** Nature (London). 260(5547):158-159, 1976.

The anterior amygdala of the rat, which has a high concentration of opiate receptors, is used to investigate the effects of direct unilateral injection of morphine sulphate. Twenty two rats were anesthetized with sodium pentobarbital and bilateral cannula recording electrode assemblies were implanted in the anterior amygdala. The permanently implanted cannulae served as a guide for smaller fluid delivery cannulae and as one pole of the bipolar recording assembly that monitored changes in electrical activity at the injection site. Injections of opiates and control injections of saline were delivered at a rate of .03 microliter s(-1) during 30 s. It was found that injections of opiates such as morphine and levorphanol produced seizures at the injection site that propagated to the mirror focus in the contralateral hemisphere. It was also found that tolerance to opiates develops at the injection site but the mirror focus retains normal sensitivity to opiates in spite of the shared epileptiform activity. These findings show that unilateral tolerance can be produced by unilateral intracerebral microinjection of morphine sulphate into the amygdala. Furthermore, it is shown that the morphine induced epileptiform patterns shared by both amygdala do not contribute to the development of drug tolerance. 6 references.

249486 Liebman, Jeffrey M.; Segal, David S. Department of Psychiatry, School of Medicine, University of California, San Diego, La Jolla, CA 92093 **Lithium differentially antagonises self-stimulation facilitated by morphine and (+)-amphetamine.** Nature (London). 260(5547):161-163, 1976.

The effects of acute and chronic doses of lithium (Li) on electrical self-stimulation of the brain (SS) in the substantia nigra of rats are examined to explore the mechanism underlying Li's antimanic action. Electrodes were implanted stereotactically in substantia nigra of 100 to 200 day old rats. One week after surgery, SS tests began in operant conditioning chambers. The brain was stimulated by sine wave a.c. current. Rats were required to exceed a criterion performance of 1,100 bar-presses per 30 minutes when reinforced by optimal current intensities. All screening and drug SS sessions lasted 30 minutes. After completion of drug treatments, rats were killed and electrode placements were verified. Results are said to suggest that (+)-amphetamine and morphine induced facilitation of SS are mediated by different mechanism of catecholamine neurotransmission. Enhancement of activity and SS by low doses of (+)-amphetamine is believed to result from facilitation of catecholamine release from a newly synthesized pool. In contrast, it is noted that the effects of morphine on activity seem to depend on a response sensitive pool of stored catecholamines. It is suggested, on the basis of the results found, that Li may, for example, be effective in the treatment of morphine addiction, but not amphetamine addiction. 36 references.

249512 Hamon, M.; Bourgoin, S.; Hery, F.; Ternaux, J. P.; Glowinski, J. Groupe, NB, INSERM U114, Laboratoire de Neurophysiologie, Collège de France, 11 place Marcelin Berthelot, 75231 Paris CEDEX 05, France **In vivo and in vitro activation of soluble tryptophan hydroxylase from rat brainstem.** Nature (London). 260(5546):61-63, 1976.

Methiothepin, a potent blocker of central serotonergic receptors, is used to look for an activation of tryptophan hydroxylase, which is involved in the rate limiting step in the biosynthesis of 5-hydroxytryptamine (5-HT) in central serotonergic neurones, in the brainstems of male rats. The rats (250 - 300g) were kept in a controlled environment for ten days, injected intraperitoneally with methiothepin (20mg/kg), and decapitated 90 minutes later. Slices of the brainstem were prepared and incubated for 30 minutes at 37 degrees C in the presence of H-tryptophan. The formation of H-5-HT and H-5-hydroxyindole acetic acid was found to be markedly stimulated when compared with that in control tissues. This effect is thought to be related partly to an enhanced accumulation of H-tryptophan in brain slices; however, it is also felt to have been due to an activation of the rate of tryptophan hydroxylation, as the conversion index of tryptophan into 5-hydroxyindoles was found to be 33% higher in slices of treated rats. It is concluded that, as already proposed for tyrosine hydroxylase, tryptophan hydroxylase may be postulated as exhibiting allosteric properties which could have a major role in the regulation of 5-HT synthesis. 16 references.

249628 Peringer, E.; Jenner, P.; Marsden, C. D. Department of Neurology, King's College Hospital Medical School, Denmark Hill, London, SE5 8AF, England **Effect of metoclopramide on turnover of brain dopamine noradrenaline and 5-hydroxytryptamine.** Journal of Pharmacy and Pharmacology (London). 27(6):442-444, 1975.

A study of examining the effect of metoclopramide on dopamine turnover by measuring dopamine and its metabolite homovanillic acid (HVA) in whole brain and in corpus

striatum/mesolimbic area is reported. The effect of metoclopramide is also examined on whole brain levels of noradrenaline and its metabolite 4-hydroxy-3-methoxy-phenylglycol sulphate (MOPEG-SO₄), and on 5-hydroxy-tryptamine (5-HT) and its metabolite 5-hydroxyindoleacetic acid (5-HIAA). Results indicate that metoclopramide has no effect on whole brain dopamine concentrations, but causes a dose dependent increase in whole brain HVA. It increased HVA concentrations both in corpus striatum and in the mesolimbic area. Metoclopramide had no significant effect on whole brain noradrenaline, MOPEG-SO₄, 5-HT, or 5-HIAA concentrations. Data suggest that metoclopramide blocks dopamine receptors in the brain but that it has little effect biochemically on noradrenaline or 5-HT systems. Implications of results for therapy of Parkinson's disease are discussed. 23 references.

249633 Sever, Peter S. Medical Unit, St. Mary's Hospital, London W. 2, England **Receptor sensitivity in schizophrenia.** *Lancet* (London). 1(7954):312, 1976.

Recent experience with model amphetamine psychosis in animals is briefly summarized in response to the suggestion that increased receptor sensitivity to phenylethylamine/dopamine may be involved in human schizophrenia. It has been found that repeated dosage of amphetamine in rats brings about a change in the behavioral response to a standard dose of this drug. With initial doses, the effect consists of two components, stereotyped behavior which is probably mediated through striatal dopamine release and an increase in gross locomotor activity which probably involves noradrenaline. Measurement of these two activity types reveals that with repeated dosage, although tolerance develops to the noradrenergic effects, a insignificant increase in the stereotype produced by the same dose also occurs. These findings are similar to those noted in research with human amphetamine psychosis. Two explanations are suggested for the enhanced stereotyped behavior: the increased sensitivity of dopamine receptors; or a change in the balance of the two neurotransmitter amines, leading to an apparent increase in dopaminergic activity as a result of tolerance developing to the noradrenergic effects of amphetamine. Suggestions are made for further research into the state of dopamine receptor sensitivity.

249664 Pepeu, G.; Garau, L.; Mulas, M. L.; Marconcini-Pepeu, I. Department of Pharmacology, School of Medicine, University of Florence, Florence, Italy **Stimulation by morphine of acetylcholine output from the cerebral cortex of septal rats.** *Brain Research* (Amsterdam). 100(3):677-680, 1975.

The effect of morphine on the acetylcholine (ACh) output from the cerebral cortex of anesthetized rats with septal lesion is studied. The septal lesion was made by electrocoagulation, and usually consisted of the destruction of the area between the lower face of the corpus callosum, the lateral ventricles and the commissura anterior. Controls were sham operated rats. In all the sham operated rats, morphine (10mg/kg s.c.) brought about a decrease in ACh output; in contrast, in 9 of the 12 operated rats, the administration of morphine was followed by an increase in ACh output. Since destruction of the septum is known to be followed by profound changes in brain cholinergic mechanisms, including suppression of ACh by amphetamine and reduction of ACh by scopolamine, it is considered surprising that morphine could stimulate ACh output from the cerebral cortex. It is suggested that there is an indirect action of morphine on the activity of cortical cholinergic neurones, and that the septal area may play a role in this effect which is unrelated to antinociception. 21 references.

249666 Jaim-Etcheverry, Guillermo; Teitelman, Gladys; Zieher, Luis M. Instituto de Biologia Celular and Catedra de Farmacologia, Facultad de Medicina, Buenos Aires, Argentina **Choline acetyltransferase activity increases in the brain stem of rats treated at birth with 6-hydroxydopa.** *Brain Research* (Amsterdam). 100(3):699-704, 1975.

In a study of possible interactions of the adrenergic neurons and the cholinergic system during early neural development, the administration of 6-hydroxydopa to rats on the day of birth produced a marked depletion of noradrenaline in the cerebral cortex and in the spinal cord while it increased noradrenaline levels in the brainstem and the cerebellum. Choline acetyltransferase activity was markedly increased in the brainstem, remained unchanged in the cerebellum and spinal cord, and was slightly increased in the cerebral cortex. Central adrenergic neurons' response to 6-hydroxydopa led to an enhanced sprouting reflected in the increased concentration of endogenous noradrenaline in the structures close to their cell bodies. It is suggested that this process is the consequence of a retrograde influence exerted by cell bodies altered by 6-hydroxydopa injection. It is further proposed that not only sympathetic ganglion cells but also central adrenergic neurons interact with the cholinergic system during their ontogenesis. 26 references.

249667 Nomura, Yasuyuki; Tanaka, Yasue; Segawa, Tomio. Dept. of Pharmacology, Inst. of Pharmaceutical Sciences, Hiroshima University School of Medicine, Kasumi 1-2-3, Hiroshima 734, Japan **Development of the influences of sodium, catecholamine and tricyclic antidepressant drug on the uptake of (3H)5-hydroxytryptamine by rat brain synaptosomes.** *Brain Research* (Amsterdam). 100(3):705-709, 1975.

A study was conducted to define the specificity of a high affinity uptake system of (3H)5-HT by rat brain synaptosomes at the neonatal period in comparison with that of the adult stage. Neonatal synaptosomes revealed that the uptake of (3H)5-HT was temperature dependent but that the active uptake was lower than that in adult synaptosomes, suggesting that the sodium dependence of the high affinity (3H)5-HT uptake increases with age. The inhibitory influences of L-norepinephrine (L-NE) or dopamine (DA) was expressed as a concentration of 50% inhibition (IC₅₀) on the high affinity uptake of (3H)5-HT at both the neonatal and the adult stages. DA was about 10 times more effective in inhibiting (3H)5-HT accumulation than L-NE at both developmental periods, suggesting that DA at a higher concentration accumulates in 5-HT neurons more than does L-NE. Furthermore, IC₅₀ values of both catecholamines on (3H)5-HT uptake demonstrated no difference between the neonate and the adult, indicating that neonatal 5-HT synaptosomes can accumulate (3H)5-HT with almost the same specificity as at the adult stage. No differences were revealed at various postnatal stages of the inhibitory action of the tricyclic antidepressants desmethylinipramine and imipramine; this result is considered to further support the hypothesis that the high affinity (3H)5-HT transport may be specific for 5-HT neurons in the neonatal period. 14 references.

249675 Clark, Judith A.; Clark, Michael S. G.; Palfreyman, Elizabeth S.; Palfreyman, Michael G. Beecham Pharmaceuticals, Research Division, Medicinal Research Centre, The Pinnacles, Harlow, Essex, England **The effect of tryptophan and a tryptophan/5-hydroxytryptophan combination on indoles in the brains of rats fed a tryptophan deficient diet.** *Psychopharmacologia* (Berlin). 45(2):183-188, 1975.

In a study of the biochemical effects produced by indolamine precursors, rats maintained on a tryptophan deficient diet had reduced brain and serum tryptophan and brain 5-hydroxyindolacetic acid levels compared to controls. 5-Hydroxytryptophan and L-tryptophan administered to these deficient rats in a combination (5:95) produced a greater elevation of indolamines and tryptophan in the brain than either amino acid alone. In rats maintained on a normal diet the urinary output of 3-hydroxykynurenine was considerably reduced by treatment with the combination of amino acids as compared to tryptophan treatment. 5-Hydroxytryptophan reduced the induction of kynurenine synthesis in the liver produced by tryptophan, implying that it is capable of inhibiting the enzyme tryptophan pyrrolase *in vivo*. It is suggested that the possession by 5-hydroxytryptophan of tryptophan pyrrolase inhibitory properties may make the administration of the combination a better treatment of depressed patients exhibiting an indolamine deficit than either amino acid alone. 31 references. (Author abstract modified)

249749 Fouriez, George; Wise, Roy A. Center for Research on Drug Dependence, Department of Psychology, Concordia University, Montreal, Quebec, Canada **Pimozide-induced extinction of intracranial self-stimulation: response patterns rule out motor or performance deficits.** *Brain Research* (Amsterdam). 103(2):377-380, 1976.

The temporal pattern of self-stimulation after doses of pimozide, that have been argued as decreasing or blocking the perception of reward, are assessed. Ten rats were stereotactically implanted with electrodes aimed at the hypothalamic area. The animals were given 22 daily 30 min self-stimulation sessions. Four hours before the 14th, 18th, and 22nd days, the animals were given .05, .16, and .50 mg/kg pimozide. Results show that pimozide reduced the overall rate of self-stimulation in a dose related fashion and produced a pattern of decreased responding that is thought to reflect decreased reward value of stimulation rather than decreased performance capacity of the animal. It is concluded that to the degree to which the effects of pimozide are correctly attributed to a specific action on dopaminergic systems, results indicate a role for dopamine in central mediation of reward. 15 references.

249899 Javoy, France; Sotelo, Constantino; Herbet, Alain; Agid, Yves. Groupe NB, INSERM U. 114, Collège de France, Paris 5, France **Specificity of dopaminergic neuronal degeneration induced by intracerebral injection of 6-hydroxydopamine in the nigrostriatal dopamine system.** *Brain Research* (Amsterdam). 102(2):201-215, 1976.

The neurotoxic specificity of injections of 6-hydroxydopamine (6-OHDA) into areas containing either dopamine (DA) cell bodies (substantia nigra) or DA axon terminals (striatum) was studied. This selective effect was compared to the unspecific effects of copper sulfate (CuSO₄) injection and electrocoagulation. One to two days after unilateral nigral injection of 2 micrograms of either 6-OHDA or CuSO₄ into the nigra, the volume of the unspecific lesions around the tip of the cannula was very similar. Only the 6-OHDA induced lesions were associated with elective degeneration of the nigral DA neurons. Ten days after the administration of the same compounds, the gliosis in the substantia nigra was much more extensive in CuSO₄ treated rats than in 6-OHDA treated rats; however, the reduction of DA concentrations in the ipsilateral striatum was only noticeable after 6-OHDA (-62%). A somewhat similar decrease of striatal DA levels (-52%) was observed after large electrocoagulation of the substantia nigra. Ten days after 6-OHDA or electrolytic lesion of the striatum,

the Michaelis-Menten constants for DA, serotonin, and choline uptakes were similar in the striata of both sides, suggesting that the uptake process in the nondamaged neurons of the lesioned side was functionally normal. Following electrolytic lesion of the striatum, serotonin and choline V_{max} values were decreased to about the same extent as the striatal reduction in weight and DA levels. When directly administered into the striatum, 6-OHDA also produced a decline in DA concentration and V_{max}, but, in contrast, did not affect serotonin and choline uptake (V_{max}), suggesting that the drug specifically destroyed dopaminergic neurons. It is concluded that selective DA denervation can be achieved when appropriate amounts of the drug are injected into brain tissue in order to limit the unspecific lesion. 24 references. (Author abstract)

249930 VonVoigtlander, P. F.; Losey, E. G. Upjohn Company, Kalamazoo, MI 49001 **On the use of selective neurotoxic amine analogs to measure the blockade of norepinephrine and 5-hydroxytryptamine uptake systems by antidepressants.** *Research Communications in Chemical Pathology and Pharmacology*. 13(3):389-400, 1976.

A series of experiments designed to determine if antidepressant drugs might antagonize 6-hydroxydopa(6-OH-D) induced norepinephrine (NE) depletions, adapt p-chloromethamphetamine (p-CMA) antagonism as an assay for measuring the blockade of 5-hydroxytryptamine (5-HT) uptake system, and to determine if anxiolytic activity antagonizes the effects of antidepressants is reported. It was found that in pargyline or carbidopa pretreated mice, 6-OH-D causes a depletion of brain NE. Several antidepressant compounds block the depletion after pargyline but not after carbidopa pretreatment. Similarly, p-CMA induced depletion of brain 5-HT is blocked by several antidepressants. Diazepam antagonizes the ability of imipramine to block the NE depletion induced by 6-OH-D but not the 5-HT depletion induced by p-CMA. It is concluded that the blockade of selective neurotoxic induced depletions of biogenic amines is a useful *in vivo* technique for determining the effects of drugs on the amine uptake systems. However, the results for compounds with mixed antidepressant/anxiolytic activity must be viewed with caution. 15 references. (Author abstract modified)

249983 Duffy, Frank H.; Snogross, S. Robert; Burchfiel, James L.; Conway, Janet L. Seizure Unit Neurophysiology Laboratory, Dept. of Neurology, Harvard Medical School, Children's Hospital Medical Center, Boston, MA 02115 **Bicuculline reversal of deprivation amblyopia in the cat.** *Nature* (London). 260(5548):256-257, 1976.

An attempt is made at bicuculline reversal of deprivation amblyopia in the cat, hypothesizing that the drug, which is a gamma-aminobutyric acid (GABA) receptor blocker, would be able to restore binocular input to more than half of the cortical neurones tested. Four kittens were monocularly deprived of vision at age 4 weeks and the attempted reversal occurred at age 8 months. Results, as predicted, indicate that intravenous bicuculline made visual cortical neurones accessible to stimulation of the deprived eye in cats with monocular deprivation amblyopia. The amblyopic eye receptive fields (RF) showed the same properties as normal eye RF, suggesting that the pathways between the amblyopic eye and the visual cortex may be capable of normal physiological function in spite of morphological changes which have been found in such preparations. Since bicuculline was given intravenously, the data do not indicate where it acts to restore binocularity. It is postulated, however, that restoration of binocular input occurs through reduction of inhibitory mechanisms by way of GABA

receptor blockage, and that, if this is true, the total dominance by the normal eye results from active inhibition of the relatively intact input from the amblyopic eye. Feline amblyopia may therefore not involve a permanent, irreversible loss of visual function. 17 references.

249984 Korf, Jakob; Zielesman, Marrie; Westerink, Ben H. C. Department of Biological Psychiatry, Groningen University, Oostersingel 59, Groningen, The Netherlands **Dopamine release in substantia nigra?** *Nature* (London). 260(5548):257-258, 1976.

Metabolic research demonstrating that dopamine (DA) can be released from the dendritic processes in the substantia nigra of rats is reported. DA metabolism was specifically investigated after electrically stimulated release in areas containing exclusively nerve terminals (nucleus caudatus, nucleus accumbens and the olfactory tubercle) and in a mesencephalic area devoid of nerve endings but containing cell bodies and dendrites rich in DA. In all cases, DA metabolite concentrations, particularly 3,4-dihydroxyphenylacetic acid (DOPAC), in areas ipsilateral to the electrode were compared with those in the corresponding contralateral areas. Results are found to suggest strongly that when a nerve impulse is generated in dopaminergic neurones, DA is released not only from nerve terminals, but also from the cell bodies and dendrites. Various drugs, including morphine, oxotremorine and neuroleptics, were observed to increase concentrations of DOPAC and homovanillic acid (HVA) in striatal and limbic structures and in the mesencephalic area containing dopaminergic cell bodies and dendrites. Three possible functions that may be attributed to DA released from nonterminal structures are considered. It is concluded that it is not possible to definitely determine which is valid for dopaminergic cells of the substantia nigra. Findings, however, challenge the concept that DOPAC is formed exclusively intraneuronally, and that release of a neurotransmitter occurs only from nerve terminals. 17 references.

250058 Westermann, K. H.; Funk, K.; Pawlowski, L. Institute of Pharmacology and Toxicology, 801 Dresden, Lingnerplatz 1, Germany **Effects of harmine and brain lesions on apomorphine induced motor activity.** *Pharmacology, Biochemistry and Behavior*. 4(1): 1-6, 1976.

A study of the effects of harmine and brain lesions on apomorphine induced motor activity in rats is reported. Application of harmine (10mg/kg IP) 30 min before apomorphine decreased the motoric effects of the latter. Following harmine an increase in 5-hydroxytryptamine and a decrease in 5-hydroxyindoleacetic acid in different brain regions have been found. Injection of 5, 6-dihydroxytryptamine into nucleus medianus raphe seven days before the experiment caused a significant increase of the apomorphine effect. Harmine pretreatment reduced this excessive motility as well as additional lesion of the substantia nigra with 6-hydroxydopamine (6-OHDA). Lesion induced by 6-OHDA alone was without significant effect on the hypermotility following apomorphine. Application of p-chlorophenylalanine three days before testing elicited an increase of apomorphine induced hypermotility which could be abolished by preceding harmine application. It is felt that the experiments demonstrate the inhibitory effect of the central serotonergic system on the apomorphine syndrome as well as the serotonergic/dopaminergic interaction in hypermotility. 39 references. (Author abstract modified)

250078 Cox, Barry; Ary, Marylouise; Chesarek, Wesley; Lomax, Peter. Department of Pharmacology, University of California, Los Angeles, CA 90024 **Morphine hyperthermia in the rat: an action on the central thermoregulatory centers.** *European Journal of Pharmacology* (Amsterdam). 36(1):33-39, 1976.

A study investigating the mechanism underlying the hyperthermic response to low doses of morphine in rats is reported. Doses of morphine sulfate less than 10mg/kg i.p. caused a rise in body temperature accompanied by vasoconstriction of the cutaneous blood vessels of the tail. This hyperthermia, unlike the hypothermia following higher doses of morphine was not blocked by naloxone nor did tolerance develop to the response. Injections directly into the hypothalamus suggested that, as with the fall in temperature after high doses of morphine, the hyperthermic effect is also due to an action on the preoptic/anterior hypothalamic thermoregulatory centers. Experiments measuring thermoregulatory behavior showed that rats delayed escaping from a heat load after low doses of morphine even though their core temperature was rising. These results suggest that low doses of morphine raise the set point of the central thermoregulatory centers resulting in a hyperthermia mediated, at least in part, by decreased cutaneous heat loss. 13 references. (Author abstract)

250080 Iorio, Louis C.; Ryan, Eileen A.; Gogerty, John H. Schering Corporation, 60 Orange Street, Bloomfield, NJ 07003 **Combinations of selected CNS depressants with d-amphetamine or mazindol on food intake and motor activity of rats.** *European Journal of Pharmacology* (Amsterdam). 36(1):89-94, 1976.

A study is reported examining the effect of amobarbital, diazepam, prochlorperazine and thioridazine alone and in combination with d-amphetamine or mazindol on food consumption and spontaneous motor activity in rats. Of the four depressants tested only amobarbital enhanced the anorexic effects of d-amphetamine and amobarbital, diazepam and prochlorperazine enhanced the hypermotility induced by d-amphetamine. None of the depressants altered the anorexic effect of mazindol but amobarbital and diazepam decreased and prochlorperazine increased the hypermotility induced by mazindol. These differential effects of the CNS depressants suggest that d-amphetamine and mazindol might have different mechanisms of anorexic or stimulatory action. The data also suggest that, to achieve anorexia with diminished CNS stimulation, combinations of d-amphetamine and any of the tested CNS depressants seem to be precluded. It is suggested that this desired clinical objective might be achieved with combination of mazindol and either amobarbital or diazepam. 12 references. (Author abstract)

250081 Ungar, Frieda; Hitri, Ana; Alivisatos, Spyridon G. A. Department of Biochemistry, Chicago Medical School, Chicago, IL 60612 **Drug antagonism and reversibility of the binding of indoleamines in brain.** *European Journal of Pharmacology* (Amsterdam). 36(1):115-125, 1976.

A study is reported investigating the specificity of the binding of serotonin (5-HT) to brain preparations with various competitive agents. A probable relationship between their structure and their capability of displacement was suggested. Bufotenine and morphine displaced serotonin binding to synaptic membranes 87% and 49% respectively. Dissociation constants of the binding of 5-HT and tryptamine to synaptic membranes, and displacement constants of certain drugs were determined. The binding of 5-HT and tryptamine to calf brain preparations was also investigated by equilibrium dialysis, in order to determine affinity constants and reversibility of the binding. Differences were noted in the specificity of binding sites for serotonin and tryptamine, suggesting a different binding site for tryptamine. Extrapolations of Scatchard plots were used for determination of the constants. A characteristic low dissociation constant was found for 5-HT in synaptic membranes. It is felt that the binding macromolecule (receptor?) is a proteolipid. 32 references. (Author abstract)

250082 Cox, Barry; Kastin, Abba J.; Schnieden, Harold. Department of Pharmacology, Materia Medica and Therapeutics, University of Manchester, England **A comparison between a melanocyte-stimulating hormone inhibitory factor (MIF-I) and substances known to activate central dopamine receptors.** *European Journal of Pharmacology* (Amsterdam). 36(1):141-147, 1976.

A study is reported in which the tripeptide prolyl-leucyl glycine amide, a melanocyte stimulating hormone inhibitory factor (MIF-I), reported to be effective in improving symptoms of Parkinson's disease, is compared with drugs known to activate dopamine receptors in rat and mouse brain. Unlike apomorphine, amphetamine and amantadine it was incapable of producing stereotyped behavior in the rat and unlike L-dopa it was also ineffective in rats pretreated with the monoamine oxidase inhibitor mebanazine. It did not potentiate apomorphine or amphetamine in this test. MIF-I did not antagonize chlorpromazine induced loss of locomotor activity in mice, an effect which was antagonized by apomorphine, amphetamine and amantadine. Chlorpromazine hypothermia in the mouse was antagonized by L-Dopa but not only by MIF-I. Similar findings were obtained in reserpine pretreated mice. These results suggest that the reported beneficial effect of MIF-I in Parkinson's disease is unlikely to be due to an interaction with dopamine systems in the brain. 17 references. (Author abstract)

250084 Baez, Luis A.; Eskridge, Nancy K.; Schein, Roland. Department of Psychology, Southern Illinois University, Carbondale, IL 62901 **Postnatal development of dopaminergic and cholinergic catalepsy in the rat.** *European Journal of Pharmacology* (Amsterdam). 36(1):155-162, 1976.

A study investigating the cataleptic response to various doses of the dopamine receptor antagonist spiperone and the cholinergic agonist pilocarpine in rats of different ages is reported. Spiperone produced catalepsy in rats 1, 5 and 10 days old, and also in adults. Pilocarpine produced catalepsy in 15 day old and 20 day old rats, as well as in adults, but not in 10 day old animals. These results suggest that dopaminergic neurons involved in catalepsy are already functional in neonates. Cholinergic substrates of catalepsy, on the other hand, appear to reach functional maturity after the second week of life. 24 references. (Author abstract)

250085 Roth, Robert H.; Murrin, L. Charles; Walters, Judith R. Departments of Pharmacology and Psychiatry, Yale University School of Medicine, New Haven, CT 06510 **Central dopaminergic neurons: effects of alterations in impulse flow on the accumulation of dihydroxyphenylacetic acid.** *European Journal of Pharmacology* (Amsterdam). 36(1):163-171, 1976.

Stimulation of the nigro neostriatal or mesolimbic dopamine pathway results in a stimulus dependent increase in the accumulation of dihydroxyphenylacetic acid (DOPAC) in the neostriatum and olfactory tubercles, respectively. A block of impulse flow induces pharmacologically by administration of gamma-butyrolactone or by placement of a lesion in the dopamine pathway results in a decrease in the steady state levels of DOPAC. Drugs which have previously been shown to alter impulse flow in central dopaminergic neurons also produce a predictable change in the brain levels of DOPAC. Drugs which increase impulse flow in nigro neostriatal or mesolimbic dopamine neurons increase DOPAC levels in the striatum and olfactory tubercles and drugs which reduce impulse flow caused a reduction in DOPAC. Pargyline, a monoamine oxidase inhibitor, causes a rapid depletion of striatal DOPAC suggesting that this metabolite is rapidly

cleared from the brain. Administration of benztropine, a potent inhibitor of dopamine reuptake causes a significant decrease in striatal DOPAC and partially prevented the stimulus induced increase in the accumulation of DOPAC. These observations together with the finding that about 85% of the DOPAC in the striatum disappears when the dopamine neurons in the nigro neostriatal pathway are destroyed suggests that the majority of striatal DOPAC is formed within the dopaminergic neurons and may reflect the metabolism of dopamine which has been released and recaptured. It is concluded that short-term changes in brain levels of DOPAC appear to provide a useful index of alterations in the functional activity of central dopaminergic neurons. 30 references. (Author abstract)

250088 Creese, Ian; Feinberg, Andrew P.; Snyder, Solomon H. Departments of Pharmacology and Experimental Therapeutics, Johns Hopkins University, School of Medicine, Baltimore, MD 21205 **Butyrophenone influences on the opiate receptor.** *European Journal of Pharmacology* (Amsterdam). 36(1):231-235, 1976.

A study examining the interaction of neuroleptic drugs with the opiate receptor was investigated by inhibition of the stereospecific binding of 3H-naloxone. Benperidol and pimozide, with IC sub 50's were more potent than the classical opiates meperidine and propoxyphene. A systematic structure activity/relationship was evident with the basic opiate structure of a benzene and a piperidine ring preserved in active compounds. No correlation between neuroleptic activity and binding to the opiate receptor is demonstrated. 10 references. (Author abstract)

250107 Marietta, M. P.; White, P. F.; Pudwill, C. R.; Way, W. L.; Trevor, A. J. Department of Pharmacology, University of California, San Francisco, CA 94143 **Biodisposition of ketamine in the rat: self-induction of metabolism.** *Journal of Pharmacology and Experimental Therapeutics*. 196(3):536-544, 1976.

Four pharmacologic actions of intravenous ketamine (30mg/kg) are studied in the rat. To elucidate the mechanism(s) terminating the pharmacologic effects, animals were pretreated with ketamine and agents anticipated to modify hepatic microsomal metabolism, including phenobarbital and 2-diethylaminoethyl-2,2-diphenylvalerate HCl (SKF 525A). SKF 525A pretreatment markedly prolonged ataxia, analgesia and agitation, in addition to significantly elevating brain and plasma ketamine levels subsequent to the initial 10 minutes following injection. Thus hepatic metabolism appeared to play a prominent role in the termination of the posthypnotic effects of the drug. While significantly shortening the durations of the three posthypnotic events, phenobarbital and ketamine pretreatments also lowered the brain and plasma levels of ketamine. With all pretreatments, brain ketamine levels were almost identical at the cessation of hypnosis (25micrograms/g of tissue) and ataxia (8-10 micrograms/g of tissue). No pretreatment altered either the duration of loss of righting reflex (hypnosis) or brain and plasma ketamine levels during the initial 10 minutes after injection. Approximately 70% of the injected drug was recovered from four tissues, skeletal muscle, gut, skin and liver, at 10 minutes after injection; thus redistribution from brain to other tissues appeared to play a major role in the cessation of hypnosis. Ketamine pretreatment caused a twofold increase in the rate of its in vitro hepatic microsomal metabolism. Brain and plasma ketamine levels 30 minutes after injection were nearly identical in rats pretreated with ketamine and phenobarbital, although phenobarbital pretreatment resulted in a four fold increase in

in vitro ketamine hepatic metabolism. 19 references. (Author abstract)

250108 White, Paul F.; Marietta, Michael P.; Pudwill, Charles R.; Way, Walter L.; Trevor, Anthony J. Department of Pharmacology, University of California, San Francisco, CA 94143 **Effects of halothane anesthesia on the biodisposition of ketamine in rats.** *Journal of Pharmacology and Experimental Therapeutics*. 196(3):545-555, 1976.

A study examining the effects of halothane anesthesia on the biodisposition of ketamine in rats is reported. Ketamine was rapidly distributed into highly vascular organs and subsequently redistributed to less well perfused tissues, with concurrent hepatic metabolism and urinary and biliary excretion, after both i.m. and i.v. administration in the rat. Halothane was found to prolong the plasma and brain half-life of ketamine (50mg/kg i.m.) and also to increase the duration of ketamine induced ataxia when the two drugs were administered concomitantly. Halothane anesthesia (0.8% halothane in oxygen) produced a decrease in the rate of uptake and delayed distribution and redistribution of ketamine (50mg/kg i.m.), while the rate of urinary excretion of ketamine was not significantly altered. Similarly, redistribution of intravenously administered ketamine (30mg/kg i.v.) was slowed in the presence of halothane. In vitro hepatic microsomal metabolism of ketamine and its principle N-demethylated metabolite, metabolite I, was inhibited noncompetitively by halothane with inhibitor constants (K_i) for halothane estimated to be 1.56 and 1.64mM, respectively. The gas anesthetic also decreased the overall rate of in vivo metabolism of ketamine (30mg/kg i.v.) in a concentration dependent manner. Thus halothane anesthesia, by decreasing uptake, distribution, redistribution and metabolism of intramuscularly administered ketamine, produced significant prolongation of its pharmacologic action on the central nervous system. Results imply that concomitant use of inhalational anesthetics may prolong pharmacologic actions of other agents via effects on distribution/redistribution processes as well as on metabolism. 28 references. (Author abstract modified)

250109 Lee, I. P.; Lucier, G. W. Environmental Toxicology Branch, National Institute of Environmental Health Sciences, Research Triangle Park, NC 27709 **The potentiation of barbiturate-induced narcosis by procabazine.** *Journal of Pharmacology and Experimental Therapeutics*. 196(3):586-593, 1976.

A study investigating the less possible interaction between barbiturates and procabazine (MIH) in an attempt to elucidate the mechanisms of the observed side-effects is reported. MIH, N-isopropyl- α -(2-methylhydrazino)- ρ -toluamide (NSC-77213), a clinically effective antineoplastic agent, induces sleep in mice at its optimally effective dose (400mg/kg) and prolongs hexobarbital sleeping times. MIH (400mg/kg) was found to increase the period of sleep following hexobarbital (100mg/kg) nearly 10 fold. Nonhypnotic doses of MIH also significantly prolonged hexobarbital induced sleep. Hexobarbital half life in plasma was prolonged six to seven times by prior treatment with MIH (400mg/kg). Liver microsomes from mice treated with MIH exhibited decreased metabolism of the following substrates in vitro; hexobarbital, aminopyrine, ethylmorphine and aniline. Cytochrome P-450 levels were also decreased by MIH treatment. Maximal decreases in enzyme activity and P-450 content occurred between four and eight hours following treatment. Pretreatment with phenobarbital decreased the effectiveness of MIH to prolong hexobarbital sleeping times while pretreatment with SKF-525A added to the potentiating effect of MIH. Two major metabolites of MIH had neither

central nervous system hypnotic effect nor inhibited hepatic microsomal mixed function oxidases. It is felt that MIH potentiation of hexobarbital induced sleep is probably due both to its direct hypnotic effect and inhibition of mixed function oxidase activity. 27 references. (Author abstract modified)

250110 Cott, Jerry M.; Breese, George R.; Cooper, Barrett R.; Barlow, T. Steven; Prange, Arthur J., Jr. Department of Psychiatry, University of North Carolina, Chapel Hill, NC 27514 **Investigations into the mechanism of reduction of ethanol sleep by thyrotropin-releasing hormone (TRH).** *Journal of Pharmacology and Experimental Therapeutics*. 196(3):594-604, 1976.

A study is presented to further explore the reversal of ethanol sedation produced by thyrotropin releasing hormone (TRH). TRH, administered intraperitoneally, was found to antagonize ethanol induced sleep and hypothermia in mice without affecting brain ethanol content. This reduction of the actions of ethanol was also apparent after oral or intracisternal administration of TRH. In addition, TRH reduced ethanol induced sleep in rats, hamsters, gerbils and guinea pigs. Evidence that the pituitary/thyroid axis is not necessary for the effects of TRH is provided by observations that hypophysectomy did not reduce TRH antagonism of ethanol narcosis and findings that neither triiodothyronine nor thyrotropin mimicked its action. Certain analogs of TRH, which have little effect on the pituitary, were also found to antagonize ethanol induced sleep and hypothermia. Pretreatment with the antiadrenergic drugs, α -methyltyrosine, phenolamine and propranolol did not antagonize the ability of TRH to reduce sleep induced by ethanol. However, after intracisternal administration of atropine methyl nitrate, TRH no longer caused a significant reduction of sleep, even though TRH antagonism of the ethanol induced hypothermia was still apparent. In contrast, central administration of other anticholinergic drugs, such as d-tubocurarine and hexamethonium, reduced ethanol induced sleep and this effect was additive with TRH. Carbachol also reduced ethanol sleeping time and this effect was also blocked by atropine methyl nitrate. The antagonism of ethanol induced sleep by dibutyl cyclic adenosine 3',5'-monophosphate was significantly reduced, but not blocked by atropine methyl nitrate. Results provide evidence that TRH has a direct extrapituitary action on brain and that both TRH and ethanol may interact with central cholinergic systems. 34 references. (Author abstract modified)

250114 Cox, Barry; Ary, Marylouise; Lomax, Peter. Department of Pharmacology, University of California, Los Angeles, CA 90024 **Changes in sensitivity to apomorphine during morphine dependence and withdrawal in rats.** *Journal of Pharmacology and Experimental Therapeutics*. 196(3):637-641, 1976.

A study examining changes in sensitivity to apomorphine during morphine dependence and withdrawal in rats is presented. Stereotyped behavior induced by injection of apomorphine hydrochloride (10mg/kg i.p.) was measured in control rats, rats made dependent on morphine and dependent rats undergoing naloxone precipitated withdrawal. The dose of apomorphine chosen was approximately the ED₅₀ dose, so that changes in sensitivity to apomorphine in either direction could be determined. Rats receiving a subcutaneous morphine (75mg) pellet implant 72 hours previously demonstrated an increased sensitivity to apomorphine when compared with placebo implanted controls. During withdrawal precipitated by injection less of naloxone hydrochloride (0.2mg/kg i.p.) this increased sensitivity disappeared. Naloxone alone, in a dose of

1.0mg/kg but not 0.2mg/kg, significantly antagonized apomorphine induced stereotyped behavior and these effects of apomorphine were also reduced by an acute injection of morphine sulfate (10mg/kg). The significance of these findings with regard to changes in central dopaminergic systems during dependence and withdrawal is discussed. 22 references. (Author abstract modified)

250278 Coons, Edgar E.; Schupf, Nicole; Ungerleider, Leslie G. Department of Psychology, New York University, 6 Washington Place, New York, NY 10003 **Uses of double-pulse stimulation behaviorally to infer refractoriness, summation, convergence, and transmitter characteristics of hypothalamic reward systems.** *Journal of Comparative and Physiological Psychology.* 90(4):317-342, 1976.

A study was conducted to explore the neural mechanisms which mediate the relationship between response strength and stimulus presentation rate. It was found that to self-administer trains of pulse pairs, rats with electrodes in the hypothalamic reward system would press a lever at lower current thresholds or faster latencies, the shorter the intrapair interval -- unless the interval was so short that each second pulse fell within the refractory period following the first. By delivering all second pulses to the contralateral reward system, not only was this refractory period limitation on temporal summation circumvented but spatial summation of the two reward systems was demonstrated. It is concluded that they converge somewhere upon common neurons. Nearby nonreward structures did not share in this convergence. It was assumed that the temporal summation decline at longer intrapair intervals reflected the course of transmitter disposal at the synapse; imipramine and diisopropylfluorophosphate were peripherally administered. These drugs, which retard disposal, respectively, in adrenergic and cholinergic synapses, indeed prolonged temporal summation, supporting the assumption and implying that adrenergic and cholinergic mechanisms both mediate self-stimulation. 52 references. (Author abstract modified)

250333 Milmore, John E.; Taylor, Kenneth M. Naylor Dana Institute for Disease Prevention, American Health Foundation, Valhalla, NY 10595 **Propranolol inhibits rat brain monoamine oxidase.** *Life Sciences (Oxford).* 17(12):1843-1847, 1975.

A study was conducted to determine the effects of propranolol on monoamine oxidase (MAO) in vitro, and to relate these effects to changes in levels of serotonin (5-HT) and 5-hydroxyindoleacetic acid (5-HIAA) in rat brain. Propranolol and its d-isomer inhibit MAO from the brain of the rat. The I50 for each was 260 microM, compared to a value of 23 microM for pargyline. The I50 for the local anesthetic procaine was 22 microM in this system. Practolol, a beta-blocker that is not a local anesthetic, had only weak activity at 1mM. Levels of 5-HT were increased in the cerebral cortex of rats by treatment with d,l-propranolol (12.5 to 50mg/kg), whereas levels of 5-HIAA were decreased. Levels of 5-HT were also increased by treatment with similar doses of d-propranolol, but not by treatment with practolol. It is concluded that propranolol inhibits MAO and the metabolism of 5-HT by a mechanism unrelated to blockade of beta-adrenergic receptors and that this activity may be related to the local anesthetic properties of this drug. 22 references. (Author abstract modified)

250355 Colpaert, F. C.; Niemegeers, C. J. E.; Janssen, P. A. J. Department of Pharmacology, Janssen Pharmaceutica Research Laboratories, B-2340 Beerse, Belgium **The narcotic discriminative stimulus complex: relation to analgesic activity.** *Journal of Pharmacy and Pharmacology (London).* 28(3):183-187, 1976.

A study was conducted to investigate whether the ability of drugs to produce the narcotic discriminative stimulus complex would be related to their potency with respect to other characteristic actions produced by narcotic drugs. Results show that the ability of drugs to produce the narcotic discriminative stimulus complex is highly correlated with their analgesic activity; in contrast, no relation with their antidiarrheal activity is evident. The findings suggest that the narcotic discriminative stimulus complex is a centrally mediated effect of narcotic drugs. 23 references. (Author abstract modified)

250356 Trabucchi, M.; Govoni, S.; Tonon, G. C.; Spano, P. F. Department of Pharmacology and Pharmacognosy, University of Milan, 20129 Milan, Italy **Localization of dopamine receptors in the rat cerebral cortex.** *Journal of Pharmacy and Pharmacology (London).* 28(3):244-245, 1976.

Areas of the rat cerebral cortex were examined to establish the existence of specific dopamine sensitive adenylate cyclase activity. The percentage increase of adenylate cyclase activity in the entorhinal cortex was much larger after addition of dopamine than after equimolar concentrations of noradrenaline; however, the reverse occurred in the neocortex. The possibility that dopamine dependent adenylate cyclase is related to the dopamine receptor in some cortical areas of the rat is suggested, as is the possibility that the physiological effects of dopamine could be mediated in this area by cyclic AMP. Evaluation of dopamine dependent adenylate cyclase in the cortex furthers the understanding of the mode of action of antipsychotic drugs and the dopaminergic mechanisms underlying the pathogenesis of schizophrenia. It is concluded that the block of striatal dopamine receptors by neuroleptics, which gives rise to the extrapyramidal side-effects of these drugs through a disinhibition of striatal cholinergic neurons, may be reconsidered in a new light. 25 references.

250359 Laduron, Pierre. Department of Neurobiochemistry, Janssen Pharmaceutica, Research Laboratories, B-2340, Beerse, Belgium **Limiting factors in the antagonism of neuroleptics on dopamine-sensitive adenylate cyclase.** *Journal of Pharmacy and Pharmacology (London).* 28(3):250-251, 1976.

Limiting factors in the antagonism of neuroleptics on dopamine sensitive adenylate cyclase in rat brain was explored, and the extent to which the neuroleptic drug is dissolved or aspecifically bound to different structures in the test tube was studied to investigate the theory that a correlation between the in vitro and in vivo test is only valid within a given group of neuroleptic drugs. It is contended that a comparison between the in vitro or in vivo potency of neuroleptic drugs needs a correction factor due to the low solubility of certain drugs. Other factors to be considered in the interpretation of in vivo results are the capacity of certain drugs to cross the blood/brain barrier or to be taken up preferentially in some areas of the brain. It is concluded that a correlation between the antagonism on the dopamine sensitive adenylate cyclase and the clinical potency of neuroleptic drugs only seems possible with a given class of compounds or to compounds having similar physicochemical properties. 7 references.

250362 Racagni, G.; Zsilla, G.; Guidotti, A.; Costa, E. Laboratory of Preclinical Pharmacology, NIMH, Saint Elizabeths Hospital, Washington, DC 20032 **Accumulation of cGMP in striatum of rats injected with narcotic analgesics: antagonism by naltrexone.** *Journal of Pharmacy and Pharmacology (London).* 28(3):258-260, 1976.

Actions of various doses of analgesics on the cGMP content of striatum in rats killed with microwave radiation to inactivate

tivate brain enzymes in less than 2 s is discussed. Morphine increases cGMP content in striatum and nucleus accumbens but not in cerebellar cortex and deep cerebellar nuclei. This suggests that if morphine inhibits the GABA system in striatum its action is probably indirect. It is contended that since morphine fails to change the cGMP content in cerebellum, a direct action of the drug on guanyl cyclase can not be the mechanism whereby these analgesics affect the cGMP content of striatum. Whether the increase in striatal cGMP content is related to an activation of opiate receptors or is mediated by an inhibition of GABA system elicited through the activation of opiate receptors was not established. 26 references.

250376 Fuentes, Jose A.; Oleshansky, Marvin A.; Neff, Norton H. Laboratory of Preclinical Pharmacology, National Institutes of Mental Health, Saint Elizabeth's Hospital, Washington, DC 20032 Comparison of the apparent antidepressant activity of (-) and (+) tranlycypromine in an animal model. *Biochemical Pharmacology* (Oxford). 25(7):801-804, 1976.

The antidepressant activity of the two isomers of tranlycypromine (TCP) is evaluated using the antagonism of reserpine induced inhibition of spontaneous motor activity, and compared with the concentration of the isomers in the brain and with the ability of the drugs to block monoamine oxidase. The isomers of TCP readily entered the rat brain after intraperitoneal administration and reached peak concentrations within 15 min. Apparently, (-) TCP entered the brain more rapidly and reached somewhat higher concentrations than (+) TCP. After a dose of 25 mg/kg of (-) or (+) TCP, there was significantly more drug in brain than has been reported necessary to block the reuptake of amines by synaptosomes. Both isomers blocked monoamine oxidase in vivo and in vitro. (+) TCP was between 10 and 60 times more active than (-) TPC, depending on the amine substrate evaluated, and both isomers were better inhibitors of type B monoamine oxidase activity than type A activity. The (+) isomer was more active in preventing reserpine induced sedation in the rat than the (-) isomer. The ability to prevent the reserpine syndrome was apparently related to the ability of the drugs to block monoamine oxidase activity rather than to blockade of amine reuptake. 15 references. (Author abstract modified)

250378 Pert, Candace B.; Snyder, Solomon H. Adult Psychiatry Branch, National Institute of Mental Health, Bethesda, MD 20014 Opiate receptor binding -- enhancement by opiate administration in vivo. *Biochemical Pharmacology* (Oxford). 25(7):847-853, 1976.

A study was conducted to examine the influence of administration in vivo of opiate receptor binding in mice. Administration of opiate agonists and antagonists to mice produces a dose dependent 50% to 100% enhancement of stereospecific (3H)dihydromorphine or (3H)nalozone binding to brain homogenates within 5 min. Three opiate antagonists are 10 to 1000 times more potent in eliciting this increase in binding than their structurally analogous agonists. Nalozone, the antagonist with the least agonist activity, is the most potent drug in producing receptor enhancement. Implantation of morphine pellets in mice increases receptor binding 30% to 100% for 2 to 108 hr with no time dependent trend. Drug induced receptor binding enhancement appears to involve an increase in number of binding sites rather than a change in receptor affinity. Sodium, which increases binding of opiate antagonists in normal mouse brain homogenate, fails to increase binding of (3H)nalozone in homogenates derived from nalozone injected mice. 24 references. (Author abstract modified)

250379 Durden, David A.; Philips, Stephen R.; Boulton, Alan A. Psychiatric Research Unit, University Hospital, Saskatoon, Saskatchewan S7N 0W8, Canada Identification and distribution of benzylamine in tissue extracts isolated from rats pretreated with pargyline. *Biochemical Pharmacology* (Oxford). 25(7):858-859, 1976.

A study was conducted to determine whether benzylamine occurs endogenously in the rat and is elevated by pargyline, or whether it originates in vivo as a metabolite of pargyline. Tissues were obtained from male Wistar rats, either treated or untreated with pargyline hydrochloride or iproniazid phosphate. Tissues from untreated animals were removed to determine which, if any, were metabolizing pargyline to benzylamine. Results show that although most tissue samples containing 25 ng deuterated internal standard indicated the presence of benzylamine in amounts greater than that found in the reagent blanks, the differences were not statistically significant. It is concluded that benzylamine may be produced via the hydroxylamine metabolic route, either directly or through chemical conversion of an intermediate hydroxylamine. 16 references.

250380 Horng, Jong S.; Wong, David T. Lilly Research Laboratories, Indianapolis, IN 46206 Effects of serotonin uptake inhibitor, Lilly 110140, on transport of serotonin in rat and human blood platelets. *Biochemical Pharmacology* (Oxford). 25(7):865-867, 1976.

A report is presented to show that 3-(p-trifluoromethylphenoxy)-N-methyl-3-phenylpropylamine hydrochloride (Lilly 110140) inhibits the process of 5HT uptake in platelets of rat and human blood plasma. Platelet rich plasma was prepared from male albino Wistar derived rats and human blood was obtained from healthy donors by venous puncture. The short duration and lack of potency of chlorimipramine on (3H)5HT uptake into platelets in vivo is suggested to reflect the N-demethylation of chlorimipramine, giving chlorodesipramine, which is reported to be a weaker inhibitor of 5HT uptake but a better inhibitor for NE uptake. In contrast to chlorimipramine, the N-demethylated product of Lilly 110140 is believed to be equally active in the inhibition of 5HT uptake into rat blood platelets. Both Lilly 110140 and its N-demethylated product are considered to be responsible for the prolonged inhibition of 5HT uptake into platelets in vivo. 14 references.

250655 Beaubien, Arthur R.; Mathieu, Lise F.; Coldwell, Blake B. Drug Toxicology Division, Health Protection Branch, Department of National Health and Welfare, Ottawa, Canada Effects of thioridazine and diazepam on the pharmacokinetics of (14C)imipramine in rat: acute study. *Journal of Pharmacy and Pharmacology* (London). 27(7):484-490, 1975.

The pharmacokinetics of (14C)imipramine (10 mg/kg-1) are investigated in male rats for interaction with thioridazine (16 mg/kg-1) or diazepam (10 mg/kg-1). All drugs were administered orally with the test substances being given 40 min before (14C)imipramine dosing. Bile and urine were collected for 90 min after the radioactive drug was given. The animals were then killed and the tissues removed. Thioridazine reduced the excretion of radioactivity into the bile and urine, and increased the weight of the contents within the gastrointestinal tract. These effects are interpreted as being mainly due to a reduction in gastrointestinal motility resulting in a slower stomach emptying of (14C)imipramine. No effect on metabolism was detected. Diazepam pretreatment reduced the concentration ratio of radioactivity in the small intestinal contents to that of plasma, but did not alter the tissue distribution,

metabolism or excretion of (14C)imipramine. 20 references. (Author abstract)

250656 Colpaert, Francis C.; Wauquier, Albert; Niemegeers, Carlos; Lal, Harbans. Department of Pharmacology, Janssen Pharmaceutica Research Laboratories, B-2340-Beerse, Belgium **Reversal by a central antiacetylcholine drug of pimozone-induced inhibition of mouse-jumping in amphetamine-dopa treated mice.** *Journal of Pharmacy and Pharmacology* (London). 27(7):536-537, 1975.

The effects of a central antiacetylcholine drug on the reversal by pimozone of the jumping behavior in mice elicited by treatment with a combination of amphetamine and L-Dopa are studied. Male albino mice which were administered the amphetamine/L-Dopa combination exhibited intense jumping activity which was blocked by pimozone. However, pretreatment with dextimide was observed to produce a clear reversal of the jumping. Pretreatment with isopropamide, a peripherally acting antiacetylcholine drug, was not found to resemble dextimide in reversing pimozone action, suggesting that the dextimide action was centrally mediated. It is suggested that the described actions of neuroleptic drugs involve an interaction with a cholinergic system which is inhibited by dopamine stimulation of central brain areas. Uncertainty is expressed as to why antiacetylcholine drugs do not themselves cause jumping in naive animals. 10 references.

250723 Sever, Peter S.; Caldwell, John; Williams, R. Tecwyn. Department of Biochemistry, St. Mary's Hospital Medical School, London W2 1PG, England **Tolerance to amphetamine in two species (rat and guinea pig) that metabolize it differently.** *Psychological Medicine* (London). 6(1):35-42, 1976.

The proposal that p-hydroxynorephedrine, a metabolite of amphetamine, is responsible for the tolerance that occurs to this drug is investigated. To test this idea, the development of tolerance to amphetamine was examined in the rat and the guinea pig, the former of which produces p-hydroxynorephedrine from amphetamine while the latter does not. In both species, it is found that tolerance develops to the anorectic and hyperthermic actions of amphetamine, and similar changes in the pattern of behavioral stimulation are seen. 26 references. (Author abstract)

250936 Garattini, S.; Jori, A.; Buczek, W.; Samanin R. Istituto di Ricerche Farmacologiche 'Mario Negri', Via Eritrea 62-20157, Milano, Italy **The mechanism of action of fenfluramine.** *Postgraduate Medical Journal* (Oxford). 51(1):27-35, 1975.

At a symposium organized by the Servier Research Institute held in Marbella, Spain March 1974, a summary of the present knowledge of the action of fenfluramine on brain monoamines, with particular reference to dopamine and serotonin, was presented. Fenfluramine and amphetamine have been found to exert different actions on central biogenic amines. Neither drug alters the concentration of dopamine in rat striatum, but both drugs increase striatal monovanillic acid levels with opposite stereoisomeric specificity and by different mechanisms. The evidence presented suggests that fenfluramine blocks the dopamine receptors, whereas amphetamine acts indirectly and presynaptically to stimulate the release of dopamine from dopaminergic terminals. A similar biochemical effect is achieved by completely opposite mechanisms. Neither fenfluramine nor amphetamine change the concentration of acetylcholine in whole brain. Fenfluramine and norfenfluramine though not amphetamine reportedly lower brain serotonin levels. The results with fenfluramine on release and uptake of serotonin in platelets suggest that this drug acts on

serotonin stores by two different mechanisms, the release of serotonin and the inhibition of serotonin uptake. The results of brain amine manipulations on the anorectic actions of fenfluramine and amphetamine suggest that these two drugs induce anorexia in animals by different mechanisms. An intact serotonergic system appears to be necessary to permit fenfluramine anorexia by a release of serotonin, while the catecholaminergic pathways appear to be involved in amphetamine anorexia. 52 references.

250937 Fuxe, K.; Hamberger, B.; Farnebo, L. -O.; Ogren, S. -O. Department of Histology, Karolinska Institutet, Stockholm, Sweden **On the in vivo and in vitro actions of fenfluramine and its derivatives on central monoamine neurons, especially 5-hydroxytryptamine neurons, and their relation to the anorectic activity of fenfluramine.** *Postgraduate Medical Journal* (Oxford). 51(1):35-45, 1975.

At a symposium organized by the Servier Research Institute held in Marbella, Spain March 1974, the actions of fenfluramine, norfenfluramine and 780SE, the hydrochloride of N-(2-benzoyloxyethyl) norfenfluramine and 1513 (the methane sulphate of the latter compound) on central serotonin (5HT) neurons were discussed. These effects are compared with those on the central catecholamine neurons, dopamine and noradrenaline. Effects on 5-hydroxytryptamine in mediating their anorectic activity was evaluated by studying food intake and food reward behavior in rats with 5,7-dihydroxytryptamine induced lesions of the ascending subcortical 5-HT pathway. While the results are difficult to interpret, it is felt that the motivational control of food intake mainly involved the limbic system whereas the basal control of food intake mainly involved the hypothalamus. It was found that norfenfluramine and its derivatives were less potent than fenfluramine on uptake and release of 5-HT but had similar weak actions like fenfluramine on dopamine and noradrenaline release in the hypothalamus and neostriatum respectively. The cortical noradrenaline nerve terminals however appear to be more sensitive to the releasing action of norfenfluramine and its derivatives than the hypothalamic noradrenaline nerve terminals. It is felt this action may also explain the increase of cortical noradrenaline turnover found with norfenfluramine. Finally, it was found that 5,7-DHT induced lesions of the ascending 5-HT pathways did not reduce lever pressing for food reward but may reduce exploratory behavior. 29 references.

250938 Blundell, John E.; Lessem, Micah, B. Psychology Department, University of Leeds, Leeds LS2 9JT, England **Hypothalamic lesions and drug-induced anorexia.** *Postgraduate Medical Journal* (Oxford). 51(1):45-54, 1975.

In a paper presented at a symposium organized by the Servier Research Institute held in Marbella, Spain March 1974, four experiments dealing with chemically induced anorexia in animals with hypothalamic lesions were reported. It is reported that in rats with bilateral lesions of the lateral hypothalamus amphetamine anorexia was markedly diminished while fenfluramine anorexia was significantly enhanced. This finding is consistent with the belief that these two anorectic agents operate through quite separate sites of action; amphetamine acts through the lateral hypothalamus but this zone is not crucial for the mediation of fenfluramine anorexia. The marked similarity, shown in the second experiment, between the effectiveness of fenfluramine and 5-hydroxytryptophan in lesioned animals provides further evidence for a serotonergic mechanism in fenfluramine anorexia. A third experiment indicated that anorexia produced by norfenfluramine, 780SE and compound 2858 was enhanced in animals with lateral

hypothalamic lesions. In a further experiment anterior hypothalamic lesions enhanced amphetamine anorexia but had no effect on fenfluramine anorexia. The results found here together with the results of previous experiments show that lesions in three separate, but interrelated, hypothalamic sites fail to diminish the anorexic potency of fenfluramine. It is believed that these findings cast doubt on the notion that fenfluramine anorexia is mediated through a specific hypothalamic site. 43 references.

250940 Offermeier, J.; Potgieter, B. Department of Pharmacology, Potchefstroom University, Potchefstroom 2520, South Africa. *Some effects of fenfluramine and its derivatives on the central catecholaminergic systems of mice*. Postgraduate Medical Journal (Oxford). 51(1):65-71, 1975.

In a paper presented at a symposium organized by the Servier Research Institute, held in Marbella, Spain March 1974, a study in which fenfluramine derivatives were investigated with respect to their selectivity for dopaminergic or noradrenergic transmission was reported. Mice that received simultaneous intraperitoneal injections of the dopamine receptor stimulant apomorphine and the fenfluramine derivatives 1513S, 780SE, 2858S or norfenfluramine were studied from the viewpoint of whether these injections lead to an amphetamine like increase in locomotor activity (LA). It was found that no increase in LA takes place when the fenfluramine derivatives are injected simultaneously with the central noradrenaline receptor stimulant clonidine. Since simultaneous stimulation of central noradrenergic and central dopaminergic systems is apparently necessary for an increase in LA, it is postulated that the fenfluramine derivatives are selective stimulants of the central noradrenergic system. The results indicate that fenfluramine appears to be less selective. A moderate increase in LA is obtained when fenfluramine is administered simultaneously with either apomorphine or clonidine. However, in mice pretreated with the monoamine oxidase inhibitor pargyline, the fenfluramine/apomorphine combination was found to produce a much larger increase in LA than the fenfluramine/clonidine combination. It was found that reserpine pretreatment does not alter these effects but pretreatment with alpha-methyl-para-tyrosine and reserpine abolishes the increase in LA found with the combinations. Results suggest that the fenfluramine derivatives act on central catecholaminergic systems by a more or less selective release of noradrenaline from neuronal extracellular pools. 15 references.

251061 Winson, Jonathan. Rockefeller University, New York, NY 10021. *Hippocampal theta rhythm. I. Depth profiles in the curarized rat*. Brain Research (Amsterdam). 103(1):57-70, 1976.

The effects of curare (D-TC) on theta rhythm are investigated in rats. A movable microelectrode device and two macroelectrodes were used to record theta rhythms in the freely moving animal during its initial exploration of the test cage; the animals were then immobilized by injections of D-TC and artificially respired while a step by step microelectrode penetration was carried out in the dorsoventral direction. It was observed that in the curarized rat, theta rhythm was not readily evoked by sensory stimuli. Visual and auditory stimuli were found completely ineffective. The presence of a sudden phase reversal and null occurring of CA1 at the level of stratum radiatum was observed. An amplitude peak was found in the vicinity of the hippocampal fissure. In addition to the change in depth profile, curare is found to alter the relationship between the amplitudes of the two phase reversed components of the theta rhythm. It is noted that the change in theta rhythm brought about by curare outlasts the paralytic effect of the drug. 21 references.

251070 Shigenaga, Y.; Inoki, R. Department of Anatomy, Osaka Dental School, Osaka, Japan. *Effect of morphine on single unit responses in ventrobasal complex (VB) and posterior nuclear group (PO) following tooth pulp stimulation*. Brain Research (Amsterdam). 103(1):152-156.

The effects of morphine on single unit responses elicited by tooth pulp afferents in the ventrobasal complex (VB) and the posterior nuclear group (PO), are examined and the significance of the analgesic function is compared between the two thalamic regions. Morphine effects on the pulp neurons of 126 adult male rats were determined by comparing the total number of spikes of 30 responses before and after treatment with drugs. The modal value of units isolated in VB and PO activated by contralateral and ipsilateral tooth pulp stimulation and the effects of morphine and levallorphan on single unit responses in VB and PO following contralateral and ipsilateral tooth pulp stimulation were determined. Results indicate that the majority of the pulpal neurons observed in PO are significantly affected by morphine and it is concluded that an analgesic mechanism of morphine may reside in the thalamocortical projection system between PO and the somatic sensory area. 9 references.

251072 Segal, Menahem. Isotope Department, Weizmann Institute of Science, Rehovot, Israel. *5-HT antagonists in rat hippocampus*. Brain Research (Amsterdam). 103(1):161-166, 1976.

Ninety four adult male rats were used in an attempt to evaluate serotonin antagonism on the pyramidal cells of the hippocampus (HPC) which receive serotonin containing afferents from the raphe nuclei. Certain serotonin antagonists which appeared to be most effective were also tested for effects on hippocampal cellular responses to stimulation of the raphe nuclei. Drugs used for iontophoresis were acetylcholine chloride; bicuculline; bromlysergic acid diethylamide bitartrate; lysergic acid diethylamide bitartrate; methysergide; 4',2-isopropylamine-1-hydroxylmethyl methane sulphonanilide; L-norepinephrine HCl; picrotoxin; methiothepin maleate; cyproheptadine; mianserin; serotonin creatinine sulphate, and cinnanserin. Effects of these drugs are discussed. It is concluded that the inability of a certain drug to demonstrate antagonism due to local anesthetic effects of the drug may mean that the antagonistic action cannot be tested and it should not be inferred that particular drug has or does not have an antagonistic activity against 5-HT. 22 references.

251131 Mjorndal, Tom; Wiesel, Frits-Axel; Orland Lars. Department of Pharmacology, University of Umea, S-901 87 Umea, Sweden. *Biochemical and behavioural effects of thiothixene: relation to tissue levels of the drug*. Acta Pharmacologica et Toxicologica (Kobenhavn). 38(5):490-496, 1976.

Male Sprague-Dawley rats were given a single intraperitoneal dose of a thioxanthene neuroleptic, thiothixene, in order to investigate the relationship between changes in the rate of turnover of amines in the central nervous system and the behavioral effects. The effect on the spontaneous motor activity and the level of homovanillic acid in the striatum and the olfactory tubercle were studied at various times after the injection of the drug. The concentration of thiothixene in the blood and brain was also followed. The rats showed a significant decrease in motor activity from 15 min to 12 hours after the injection. The HVA levels in the striatum and olfactory tubercle were significantly elevated from 0.5 to 18 hours, the effect on the striatum being relatively more pronounced. No clear relation between drug levels and changes in motor activity of HVA levels was found. 19 references. (Author abstract modified)

251142 Hoffman, W. E.; Phillips, M. Ian. Neurobehavior Laboratory, Department of Physiology and Biophysics, University of Iowa, Iowa City, IA 52242 A pressor response to intraventricular injections of carbachol. *Brain Research (Amsterdam)*. 105(1):157-162, 1976.

The action of intraventricular (i.v.t.) injections of carbachol on rats in which drinking and blood pressure were recorded simultaneously are studied. Twenty two male rats, including five hypophysectomized males, were implanted with a cannula in the lateral ventricle, and also with femoral artery and vein catheters. Normal (nonhypophysectomized) animals were tested centrally with a dose range of carbachol from 0.025ng to 250ng. Carbachol i.v.t. produced dose response related increases in both blood pressure and drinking, whereas intravenous infusions produced no increases. These observations indicate that the pressor effects of carbachol are of central origin and are dependent on the integrity of the central nervous system. In order to examine the role of the sympathetic nervous system five rats were given 25ng carbachol i.v.t., followed by intravenous infusions of 10mg/kg phentolamine. Blood pressure decreased from control levels. Carbachol 25ng, i.v.t. was again injected showing decreased drinking response, but pressor response was not changed, suggesting that a component other than sympathetic activation was involved in the blood pressure increase to central carbachol injections. In five hypophysectomized rats, pressor and drinking responses to a carbachol i.v.t. 25ng dose were decreased significantly (by 58%) indicating that a humoral pressor agent released from the pituitary, probably vasopressin, is one component of blood pressure increase. The hypophysectomized rats were then infused with 10mg/kg phentolamine intravenously. Blood pressure decreased and the remaining drinking and pressor response to carbachol i.v.t. was abolished. Thus it appears that the remaining pressor response observed after hypophysectomy is the result of central activation of sympathetic pressor mechanisms. 13 references.

251175 Nordberg, Agneta; Sundwall, Anders. Department of Pharmaceutical Pharmacology, University of Uppsala, S-751 23 Uppsala, Sweden Effect of oxotremorine on endogenous acetylcholine and on uptake and biotransformation of radioactive choline in discrete regions of mouse brain in vivo. *Biochemical Pharmacology (Oxford)*. 25(2):135-140, 1976.

An investigation of the effect of oxotremorine on endogenous acetylcholine on the uptake and rate of biotransformation of tracer doses of tritium labelled choline ((3H)choline) was conducted in discrete regions of mouse brain in vivo. Oxotremorine (1mg/kg) was injected intraperitoneally 15 min before an intravenous (dose of 15nmol of (3H)choline). The animals were sacrificed 1 or 5 min later by dislocation of the spine. Hypothermia was prevented by a heating lamp. The brains were rapidly dissected into six well defined regions (cerebellum, medulla oblongata, midbrain, striatum, hippocampus and cortex). Endogenous acetylcholine was significantly increased in the striatum, hippocampus and cortex but unchanged in the cerebellum, medulla oblongata and midbrain. Pretreatment with methylatropine (5mg/kg) and with atropine (5mg/kg) partly counteracted the increase of endogenous acetylcholine in the cortex and atropine also had the same effect in the striatum. The biosynthesis of (3H)acetylcholine at 1 and 5 min was decreased in all regions except the striatum. This was prevented by pretreatment with atropine (5mg/kg); methylatropine (5mg/kg) was considerably less effective. In the striatum the formation of (3H)acetylcholine was increased after administration of oxotremorine. The increase was not antagonized by pretreatment with atropine (5mg/kg) or

methylatropine (5mg/kg). Oxotremorine produced a marked decrease in the specific radioactivities of acetylcholine in the hippocampus and cortex but not in the striatum. 19 references. (Author abstract modified)

251178 Gysling, Katia; Bustos, Gonzalo; Concha, Irina; Martinez, Gloria. Department of Neurobiology, Institute of Biological Sciences, Catholic University, Santiago, Chile Effect of ethanol on dopamine synthesis and release from rat corpus striatum. *Biochemical Pharmacology (Oxford)*. 25(2):157-162, 1976.

The effect of ethanol upon dopamine (DA) synthesis and release from dopaminergic terminals was studied. Slices from rat corpus striatum were incubated in freshly oxygenated Krebs-Ringer phosphate (KRP) media of variable ionic composition containing L-tyrosine-14C(U) as dopamine precursor and in the presence and absence of ethanol (0.1 to 0.8% w/v). The addition of ethanol directly to normal KRP media produced no effect on the conversion of 14C-tyrosine to 14C-DA. As reported previously, the absence of Ca²⁺ from the incubation media markedly increased the formation of 14C-DA. The presence of ethanol in this media was not able either to block or to potentiate the Ca²⁺ free induced formation of 14C-DA. The presence of K⁺ (55 mM) in the incubation media also increased about twofold the formation of 14C-DA. Ethanol (0.2 to 0.8% w/v) added directly to the KRP high K⁺ markedly blocked the K⁺ induced formation of newly synthesized 14C-DA. The presence of ethanol did not modify the amount of 14C-tyrosine taken up by striatal slices incubated either in normal KRP or KRP high K⁺ media. A superfusion system was used to study both spontaneous and K⁺ induced release of labeled DA from striatal slices. The addition of ethanol (0.4 to 0.8% w/v) to the superfusion system was not able either to block or to potentiate the K⁺ induced release of 3H-DA previously taken up by the slices nor the K⁺ induced release of newly synthesized 3H-DA. Results suggest the existence of another regulatory mechanism of DA synthesis besides the commonly accepted one of feedback inhibition exerted by DA upon the rate limiting enzyme, tyrosine hydroxylase. The possibility is also raised that the inhibitory effect of ethanol might play a role in the intoxicating effect of ethanol in vivo. 32 references. (Author abstract modified)

251179 Isselbacher, Kurt J.; Carter, Edward A. Department of Medicine, Harvard Medical School, Boston, MA 02115 Effect of propranolol on ethanol metabolism -- evidence for the role of mitochondrial NADH oxidation. *Biochemical Pharmacology (Oxford)*. 25(2):169-174, 1976.

Ethanol metabolism in the rat as measured in vivo by 14CO₂ production or in vitro by the removal of ethanol by liver slices was inhibited approximately 30% by propranolol. There was no inhibitory effect of propranolol on rat liver alcohol dehydrogenase, catalase, NADPH dependent microsomal ethanol oxidation or formate oxidation to 14CO₂. Propranolol inhibited fatty acid oxidation to 14CO₂ in vivo as well as by liver slices and isolated hepatic mitochondria. NADH oxidation by hepatic mitochondria was also reduced by propranolol. 2,4-Dinitrophenol treatment or chronic ethanol feeding of rats stimulated alcohol metabolism as well as hepatic mitochondrial NADH oxidation. These increases were abolished by propranolol. The effect of propranolol in blocking the increase in ethanol oxidation after chronic alcohol feeding appears to be related to its action on the mitochondrial reoxidation of NADH to NAD. Propranolol inhibits mitochondrial NADH oxidation, while 2,4-dinitrophenol or chronic ethanol feeding stimulates this process. The present studies support the con-

cept that the rate of hepatic ethanol metabolism is limited, at least in part, by the mitochondrial oxidation of NADH. 27 references. (Author abstract)

251181 Carson, V. G.; Jenden, Donald J.; Cho, A. K.; Green, R. Department of Pharmacology, UCLA School of Medicine, Los Angeles, CA 90024 **Effects of the choline acetyltransferase inhibitor 3-chloro-4-stilbazole on brain acetylcholine metabolism.** *Biochemical Pharmacology* (Oxford). 25(2):195-199, 1976.

3-Chloro-4-stilbazole (CS), an effective inhibitor *in vitro* of choline acetyltransferase (ChA), was tested *in vivo* in rats and mice. Brain concentrations of CS were measured and were as high as 1 m-mole kg⁻¹ 15 min after 0.79 m-mole kg⁻¹ of CS was injected i.p. in rats. Its half-life is about 3 hr yet no changes in total brain acetylcholine (ACh) or choline (Ch) levels were seen after acute injections. However, the rate of synthesis of 2H4-ACh in rat brain after i.v. 2H4-Ch was significantly decreased after doses of 200 or 400 micromoles kg⁻¹ of CS. Repeated injections in rats reduced the total ACh level to 87% of the control level. Atropine sulfate (7.2 micromoles kg⁻¹), alone or in combination with CS, reduced rat brain ACh levels to 65% of normal. In mice, both total brain ACh and Ch levels were moderately but significantly elevated with an acute intraperitoneal injection of CS. ACh turnover was significantly decreased after doses of 200 or 400 micromoles kg⁻¹ of CS, yet it was significantly increased after an injection of 40 micromoles kg⁻¹ of CS. It is concluded that either ChA is not a rate limiting enzyme in the biosynthesis of ACh in brain or CS fails to gain access to ChA. 14 references. (Author abstract)

251184 VonVoigtlander, Philip F.; Losey, Elizabeth G. Research Laboratories, Upjohn Co., Kalamazoo, MI 49001 **Inhibition of phenylethylamine metabolism *in vivo* -- effect of antidepressants.** *Biochemical Pharmacology* (Oxford). 25(2):217-218, 1976.

Male mice or rats were used to determine if antidepressants alter the metabolism of phenylethylamine *in vivo* at nontoxic doses. Mice (CF-1) or rats (Sprague-Dawley) were treated with monoamine oxidase inhibitors and tricyclic antidepressants, acutely or chronically, prior to intravenous administration of (14C) B-phenylethylamine (14C) PEA. An acute single dose resulted in a large increase in (14C) brain levels. Similar treatment with tricyclic antidepressants failed to alter the metabolism and disposition of (14C) PEA. Species differences in monoamine oxidase activity is noted. Results *in vivo* question the importance of an inhibition of phenylethylamine deamination by tricyclics to the pharmacological effects, *in vivo*. 8 references.

251185 Fellman, J. H.; Roth, Esther S.; Heriza, Elizabeth L.; Fujita, Thomas S. Department of Biochemistry, University of Oregon Medical School, Portland, OR **Altered pattern of dopa metabolism.** *Biochemical Pharmacology* (Oxford). 25(2):222-223, 1976.

The altered pattern of dopa metabolism *in vitro* is investigated and it is reported that MK 486 (alpha methyl-alpha-hydrazino 3,4-dihydroxyphenylpropionate) is an efficient inhibitor of liver cytosol tyrosine aminotransferase (EC 2.6.1.5.). The inhibitor concentration was calculated from dosages commonly employed in human treatment, and the kinetics of enzyme activities with 3-O-methyldopa as substrate was examined. Results show that MK 486 alters at least two avenues of metabolism -- decarboxylation leading to dopamine and transamination leading ultimately to trihydroxyphenylacetate. With the disruption of these pathways by the inhibitor, O-

methylation becomes the principal pathway, giving rise to large amounts of 3-O-methyldopa which is a substrate for the relatively uninhibited ubiquitous mitochondrial transaminase. It is concluded that these observations illustrate how misleading it may be to label drugs with such definitive labels as decarboxylase inhibitors. 15 references.

251214 Kadobayashi, I.; Mikami, M.; Kato, N. Department of Psychiatry, Kyoto Prefectural University of Medicine, Kawaramachi-hirokoji, Kamigyo-ku, Kyoto, Japan **Inhibition and enhancement of photically evoked responses by different doses of L-DOPA.** *Experientia* (Basel). 32(3):343-345, 1976.

The effects of several doses of L-Dopa (L-3,4-dihydroxyphenylalanine), a precursor of dopamine, on photically evoked responses in the cat's primary visual association, and cerebellar vermal cortices were investigated. Administration of small doses (10 and 20mg/kg) reduced photically evoked responses in these cortices, while large doses (40 and 80mg/kg) enhanced them. It is contended that these differences in dosage, along with different degrees of response in the three recording sites, require further research and suggest involvement of complicated brain mechanisms. (Author abstract modified)

251217 Simon, P.; Chermat, R.; Boissier, J. R. Departement de Pharmacologie, Faculte de Medecine Pitie-Salpetriere, 91, Boulevard de l'Hopital, F-75634 Paris-Cedex 13, France **Interaction of atropine or methylatropinium with four effects of two cholinergic drugs.** *Experientia* (Basel). 32(3):371-372, 1976.

A study was conducted using mice to determine whether atropine or methylatropinium could antagonize the effects of oxotremorine and pilocarpine in four experimental situations at doses of the anticholinergic agent. Results show that in mice, pilocarpine (or oxotremorine) induced decrease in locomotor activity and increase of the reaction time to pain were antagonized by atropine and not by methylatropinium. Identical doses of atropine and methylatropinium suppressed the antagonism of the cholinergics towards reserpine induced palpebral ptosis. Cholinergics induced hypothermia was not clearly antagonized by atropine or methylatropinium. (Author abstract modified)

251225 Waldmeier, P. C.; Delini-Stula, A.; Maitre, L. Departement Forschung, Division Pharma, CIBA-GEIGY AG, CH-4002 Basel, Switzerland **Preferential deamination of dopamine by an A type monoamine oxidase in rat brain.** *Nannyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 292(1):9-14, 1976.

The effect of graded doses of clorgyline, a preferential inhibitor of MAO A, and of deprenil, a preferential inhibitor of MAO B, on the activities of serotonin deaminating MAO (MAO A) of dopamine deaminating MAO, and of phenethylamine deaminating MAO (MAO B), in rat corpus striatum were compared with the effects of the drugs on striatal levels of homovanillic acid (HVA) and 3,4-dihydroxyphenylacetic acid (DOPAC). The dose response curves for HVA and DOPAC closely follow those for MAO A and dopamine deaminating activity, whether clorgyline or deprenil was used as MAO inhibitor. In addition, the effect of these drugs on dopamine levels and on the accumulation of 3H-dopamine + 3H-methoxytryptamine formed from 3H-DOPA in rat whole brain was analysed. In contrast to the marked increases caused by clorgyline, the effects of deprenil were negligible. In reserpinized rats, clorgyline potentiated the effect of L-Dopa on motor activity; deprenil did not. These results suggest that the deamination of dopamine *in vivo* is al-

most entirely effected by MAO A. 26 references. (Author abstract)

251392 Lentzen, H.; Philippu, A. Department of Pharmacology and Toxicology, University of Wurzburg, D-8700 Wurzburg, Germany **Uptake of biogenic amines into synaptic vesicles of the caudate nucleus.** Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R1, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft, held in Mainz, Germany, March 1976, a study of uptake of biogenic amines into synaptic vesicles of the caudate nucleus is reported. It is noted that synaptic vesicles isolated from the caudate nucleus of the pig take up noradrenaline, serotonin, dopamine, octopamine and tyramine, and that the uptake of tyramine is not influenced when the vesicles are incubated in the presence of ATP-Mg⁺⁺, while the uptake of the other amines is greatly increased. On the other hand, the ATP-Mg⁺⁺ dependent uptake of dopamine into the vesicles is competitively inhibited by both serotonin and tyramine. Synaptic vesicles were isolated by differential centrifugation from the caudate nucleus and incubated with .0000007 M 3H-tyramine in the absence or in the presence of ATP-Mg⁺⁺ (.005 M each). The incubation took place at 25 degrees C for 5 min. At the end of the incubation period the vesicles were isolated from the incubated medium either by centrifugation at 80,000g for 60 min (procedure A) or by filtration through membranes (procedure B). When procedure A was used, the tyramine content of the vesicles was not influenced by ATP-Mg⁺⁺. When the vesicles were separated by procedure B, the tyramine content of the vesicles incubated in the absence of ATP-Mg⁺⁺ was similar to that found after separation by procedure A; however, the tyramine content was significantly higher when the vesicles were incubated in the presence of ATP-Mg⁺⁺. It is concluded that under certain experimental conditions, ATP-Mg⁺⁺ may also enhance the accumulation of tyramine. (Author abstract modified)

251393 Otten, U.; Thoenen, H. Department of Pharmacology, Biocenter of the University, Klingelbergstrasse 70, CH-4056 Basel, Switzerland **Mechanisms of trans-synaptic induction of tyrosine hydroxylase (TH) and dopamine beta-hydroxylase (DBH) in organ cultures of rat sympathetic ganglia: role of depolarization of the postsynaptic membrane.** Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R1, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft, held in Mainz, Germany, March 1976, a study of mechanisms of trans-synaptic induction of tyrosine hydroxylase (TH) and dopamine beta-hydroxylase carbamylcholine or nicotine at a concentration of .0001 M produced a selective induction of TH and DBH. Depolarization with high (54 mM) potassium, veratridine or batrachotoxin did not mimic the effect of nicotinic agents. Moreover, TH and DBH induction initiated by cholinomimetics remained unaffected by tetrodotoxin which selectively blocks the "fast" sodium channels and, consequently prevents the formation of action potentials. It is concluded that the selective induction of TH and DBH initiated by cholinomimetics is independent of general membrane depolarization and the formation of action potential and involves more specific mechanisms activated via nicotinic receptors. (Author abstract modified)

251394 Baumann, P. A.; Maitre, L. Research Department, Pharmaceuticals Division, CIBA-GEIGY Limited, Basle, Swit-

zerland **Effects of alpha-receptor blockers and antidepressant drugs on the presynaptic alpha-receptor of rat cerebral cortex.** Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R3, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft, held in Mainz, Germany, March 1976, a report is presented of a comparison of a series of alpha-blockers with respect to their capacity to increase the release of 3H-noradrenaline (3H-NA) by field stimulation from prelabeled rat cortical slices. Cocaine (.00002M) was added to the superfusion medium to prevent an increase in 3H-NA overflow due to uptake inhibition. Among the alpha-blockers tested, phentolamine was observed to be the most potent drug in eliciting 3H-NA release. Fourteen antidepressant drugs were tested for possible presynaptic alpha-blocking properties. After reuptake inhibition by cocaine, mianserine, amitriptyline and imipramine increased 3H-NA overflow. It is suggested that this effect is due to blockade of presynaptic alpha-receptors. This conclusion is supported by the fact that mianserine no longer increases NA release if the presynaptic receptors are previously fully blocked by phentolamine or stimulated by clonidine. Only a marginal increase in 3H-NA overflow due to blockade of the presynaptic alpha-receptors was observed with trimipramine and dibenzepine. Desipramine, clomipramine, maprotiline, nortriptyline, iprindol, viloxazine, nomifensine, and cocaine were found to be inactive. It is suggested that the presynaptic alpha-blocking component of certain antidepressant drugs may combine with the inhibition of the neuronal reuptake to increase NA levels in the synaptic cleft. (Author abstract modified)

251395 Waldmeier, P. C.; Maitre, L. Research Department, Pharmaceuticals Division, CIBA-GEIGY Limited, Basle, Switzerland **Mesolimbic area and c. striatum: relative increases in dopamine turnover by neuroleptic and related compounds devoid of antipsychotic activity.** Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R3, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 23 through 26, 1976, classical neuroleptics and related compounds (perlapine and benzocetamine) also affecting dopamine (DA) turnover are compared with regard to their ability to increase DA turnover in the rat c. striatum (c.s.) and mesolimbic area (m.a.), respectively. DA turnover was assessed by measuring alpha-methyl-p-tyrosine (alpha-MT) induced DA disappearance or endogenous levels of homovanillic acid (HVA) and 3,4-dihydroxyphenylacetic acid (DOPAC). Using the alpha-MT method, sulpiride was found to increase m.a. DA turnover preferentially. It was the most selective of the drugs tested in this respect, followed by perlapine, benzocetamine, clozapine, chlorpromazine, thioridazine and haloperidol in decreasing order. In contrast, no drug was able to increase the levels of HVA and DOPAC more effectively in the m.a. than in the c.s. After perlapine and benzocetamine, HVA levels were elevated almost to the same extent in the m.a. as in the c.s. They were less elevated in the m.a. after chlorpromazine, clozapine, and thioridazine whereas haloperidol produced the largest divergence among the drugs tested. DOPAC increases in the m.a. and c.s. were similar after haloperidol and clozapine, they were larger in the c.s. after benzocetamine, thioridazine, perlapine and chlorpromazine. These results suggest that a preferential increase in DA turnover in the m.a. implies neither neuroleptic activity per se nor a better ratio of antipsychotic activity to extrapyramidal side effects. (Author abstract modified)

251397 Delini-Stula, A. Research Department, Pharmaceuticals Division, CIBA-GEIGY Limited, Basle, Switzerland Modification of conditioned avoidance and turning behaviour by baclofen and its influence on cholinergic-dopaminergic nervous system. Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R8, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 23 through 26, 1976, modification by baclofen of conditioned avoidance and turning behavior in rats is investigated. In rats trained to avoid electric shocks and discriminate between light and darkness in a three compartment box, baclofen (Lioresal) in a dose of 4mg/kg i.p. produced marginal inhibition of learned responses without impairment of motor functions. Marked disruption of behavior occurred when baclofen was combined with benztropine, an anticholinergic drug. These effects suggest that baclofen 1) differs in its mode of action from neuroleptics, because benztropine is known to reverse their inhibitory effect on conditioned behavior and 2) interferes with systems controlled by cholinergic neurones. This was further substantiated by the finding that baclofen reversed the behavioral suppression produced by the cholinomimetic drug physostigmine (0.4mg/kg s.c.). In addition, in rats with unilateral 6-OH dopamine lesions of the nigrostriatal pathway, the compound antagonized the inhibitory action of physostigmine on turning behavior provoked by apomorphine. However, no direct cholinergic receptor blocking action of baclofen could be demonstrated. Baclofen alone had a slight facilitatory effect on apomorphine induced rotation at low doses (0.5mg/kg i.p.) but inhibited it at higher doses (5mg/kg i.p.). The effects observed indicate that baclofen interferes with both cholinergic and dopaminergic transmission but the mechanism of this interference remains unknown. (Author abstract modified)

251398 Maitre, L.; Waldmeier, P. C. Research Department, Pharmaceuticals Division, CIBA-GEIGY Limited, Basle, Switzerland Alteration of dopamine metabolism in rat brain by baclofen (Lioresal (R)). Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R9, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 1976, effects of baclofen in rat brain metabolism are investigated. Baclofen has been reported to counteract the pimo- zide induced increase in dopamine (DA) turnover in the mesolimbic area but not in the caput cauditi. This antagonism was confirmed in the mesolimbic area, but a similar effect, though somewhat less pronounced, was also found in the c. striatum. In both areas, baclofen given alone decreased DA turnover. This effect was again more marked in the mesolimbic area. In contrast to what would be expected from the observed reduction of DA turnover rates, baclofen induced a marked increase in the endogenous concentrations of striatal homovanillic acid (HVA) and 3,4-dihydroxyphenylacetic acid (DOPAC). This elevation occurred only with doses higher than 10mg/kg ip and with a latency of at least one hour. It was at its peak at 3 hrs and subsided after 6 hrs. The antagonism by baclofen of the pimo- zide effect on DA turnover was not reflected in a reduction of the pimo- zide induced rise in striatal or mesolimbic HVA and DOPAC levels. For these experiments, a dose of baclofen (10mg/kg ip) was chosen which did not elevate HVA and DOPAC levels by itself. It is concluded that baclofen shows an unusual pattern in its influence on dopaminergic mechanisms and that the apparent discrepancy between its effects on DA turnover and HVA and DOPAC levels cannot be explained on the basis of current theories of the regulation of DA metabolism. (Author abstract modified)

251399 Keller, H. H.; Schaffner, R.; Haefely, W. Department of Pharmacology, F. Hoffmann-La Roche & Co. Ltd., Basle, Switzerland Interaction of benzodiazepines with neuroleptics at central dopaminergic systems: involvement of GABA. Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R9, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, a study of the involvement of GABA in the interaction of benzodiazepines with neuroleptics at central dopaminergic systems is reported. The elevation of the homovanillic acid (HVA) content in the rat brain induced by various neuroleptics (chlorpromazine, clozapine, haloperidol and pimozide) was markedly counteracted by 4 different benzodiazepines (chlordiazepoxide, diazepam, clonazepam, and flunitrazepam), an effect which was also observed after aminooxyacetic acid (AOAA). The effect was similar in the striatum and the limbic forebrain, and was antagonized by the GABA receptor blocking agent, picrotoxin. The benzodiazepines and AOAA potentiated the cataleptic effect of the neuroleptics. The biochemical and behavioral effects are explained by suggesting that benzodiazepines enhance the activity of a GABAergic striatal system inhibitory for mesencephalic dopamine neurons which results in an attenuation of the neuroleptic induced feedback activation of the dopamine neurons. (Author abstract modified)

251400 Gramsch, Ch.; Blasig, J. Department of Neuropharmacology, Max-Planck-Institut für Psychiatrie, Kraepelinstrasse 2, 8000 Munich 40, Germany Changes in brain catecholamine turnover during precipitated morphine withdrawal in the rat. Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R9, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, 1976, a study is reported in which the turnover in brain catecholamines in morphine dependent rats before and during precipitated withdrawal was investigated. An observed rather high degree of physical dependence was induced by repeated implantation of morphine pellets; withdrawal was precipitated by naloxone or by a new benzomorphan derivative (ZK-48-491) which was shown to induce a different withdrawal pattern. Immediately after administration of both the antagonists the levels of dopamine in the striatum increased by about 25% and were still above the control levels, 1 hour later. During the same time the accumulation of HVA and the levels of DOPAC after probenecid were reduced in the striatum in respect to dependent saline treated controls. Also the level of 3-methoxytyramine was found decreased by 40% during withdrawal in this brain structure. These results suggest inhibition of dopamine release in the striatum during precipitated withdrawal. Changes measured in the noradrenergic system point in the opposite direction: The level of noradrenaline was found decreased 20% in brainstem and in the hypothalamus/thalamus, whereas the levels of the main metabolite MHPG-SO₄, as well as its accumulation after probenecid were increased 20 to 40%. These changes indicate increased utilization of noradrenaline during withdrawal. The results are discussed in view of the behavioral withdrawal changes observed after administration of drugs affecting the catecholaminergic system. (Author abstract modified)

251405 Vigouret, J. M.; Jaton, A. L.; Loew, D. M. Biological and Medical Research Division, Sandoz Ltd., CH-4002 Basel, Switzerland Possible involvement of serotonergic mechanisms in the induction of turning by LSD-25 in the rat. Naunyn-

Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R10, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 1976, a study investigating possible involvement of serotonergic mechanisms in the induction of turning by LSD-25 in the rat is reported. It is observed LSD-25 (0.05 to 1mg/kg i.p.) elicits dose related contralateral turning in rats with unilaterally degenerated nigrostriatal pathways following local injection of 6-OHDA into the substantia nigra. This observation confirms the results of Pieri et al (1974) in a similar test model and suggests a central dopaminergic stimulant action of LSD-25. However, administration of pimozide (1mg/kg i.p., 1 hr previously) only partially reduced the number of turns induced by LSD-25 from 526 plus or minus 72 to 362 plus or minus 78. Methiothepin pretreatment (1mg/kg i.p., 30 minutes previously) blocked turning induced by 0.2mg/kg i.p. LSD-25. Contralateral turning after bromocriptine (1mg/kg s.c.) was suppressed by pimozide or methiothepin pretreatment. The total rotational response elicited by apomorphine (0.25mg/kg s.c.) was reduced from 589 plus or minus 66 to 513 plus or minus 43 by pimozide, and from 616 plus or minus 69 to 234 plus or minus 101 by methiothepin pretreatment. These results indicate that a dopaminergic antagonist only partially blocks turning induced by LSD-25 or apomorphine, whereas the effect of bromocriptine is totally antagonized. The observation that pretreatment with the serotonergic antagonist methiothepin blocks the effect of LSD-25 suggests that turning induced by LSD-25 depends also on serotonergic mechanisms. (Author abstract modified)

251414 Heise, A.; Hoffmeister, F.; Wuttke, W. Institute of Pharmacology, Bayer AG, D 56 Wuppertal 1, Postfach 130105, Germany **Influence of pharmacologically active substances on a conditioned blood pressure increase in squirrel monkeys.** Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R16, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 1976, a method is described which can elevate the arterial blood pressure of squirrel monkeys by a conditioned avoidance response. The blood pressure of the animal is measured directly and continuously via a chronically implanted aortic catheter. The blood pressure is made visible to the animal by a light signal, which is turned on if the blood pressure falls below a certain threshold. The animal has to increase its blood pressure above the threshold within ten seconds, otherwise it will receive a light electric shock to the tail. The threshold is varied according to a certain schedule. The blood pressure increase induced in this way is reversible. The increase is not influenced by the beta-adrenergic blocking drug propranolol, while the alpha-adrenergic blocking drug phenox benzamine lowers the elevated blood pressure. Also the sympathetic nervous system inhibiting substances alpha-methyl-dopa, reserpine, and clonidine lower the blood pressure, whereas the tranquilizer chlordiazepoxide has no effect. Diazepam acts only very weakly. It is concluded that the blood pressure increase induced by this conditioned avoidance response is primarily caused by an increase of total peripheral resistance, that an increase of cardiac output plays only a minor role, and that tranquilizers can not block the motivation and ability of the animal to elevate its blood pressure. (Author abstract modified)

251415 Pittner, H. Chemie Linz AG, Pharmakologie, St. Peter-Strasse 25, A-4020 Linz, Austria **The influence of**

imipramine on circulatory effects of midodrine. Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R17, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 23 through 26, 1976 an investigation of the influence of imipramine on circulatory effects of midodrine is reported. It is noted that the alpha-adrenergic stimulating agent midodrine induces a biphasic increase in blood pressure in pithed rats: an initial pressure rise, being of short duration only and accompanied by a rise in heart rate, and a second, long lasting increase in blood pressure which reaches its maximum approximately 15 minutes after intravenous injection. After pretreatment with imipramine (1mg/kg i.v.), the initial effect of midodrine on blood pressure and heart rate is enhanced, while the second, long lasting pressor effect of midodrine is diminished. (Imipramine 0.3mg/kg to 3mg/kg i.v.) also dose dependency diminishes the pressor effect of midodrine in anesthetized dogs. In pithed rats pretreated with reserpine (5mg/kg given intraperitoneally 16 hours before starting the acute experiments), the initial effect of midodrine on heart rate is no longer visible, while the blood pressure rises to a high single peak. In isolated perfused rat hindquarters imipramine diminishes the midodrine induced rise in perfusion pressure. It is concluded that the initial pressor effect of midodrine in pithed rats presumably is due to a release of biogenic amines, while the alpha adrenergic properties of imipramine are responsible for the diminution of the long lasting pressor effect of midodrine in some species. (Author abstract modified)

251416 Dinnendahl, V.; Gumulka, S. W. Institut für Pharmakologie, Medizinische Hochschule Hannover, D-3000 Hanover 61, Germany **Effects of centrally acting drugs on stress-induced increase of cGMP in mouse brain.** Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R32, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 23 through 26, 1976 a study is reported in which effects of centrally acting drugs on stress induced increase of cGMP in mouse brain is investigated. To elucidate which neurotransmitters are involved in the stress induced rise of cGMP, animals were pretreated with various centrally acting drugs, forced to swim in ice water for 30 sec and sacrificed by microwave radiation. The concentration of cGMP was determined in the cerebellum and the medial forebrain (MF) containing cortex, hippocampus, hypothalamus, thalamus, striatum and midbrain. Stress increased cGMP in the cerebellum from 274 plus or minus 16 to 954 plus or minus 45 pmoles/g w.wt. and in the MF from 56 plus or minus 4 to 132 plus or minus 7 pmoles/g.w. wt. This increase was abolished by diazepam (1mg/kg), nembutal (10mg/kg), chlorpromazine (5mg/kg), haloperidol (1mg/kg), given i.p. 15 min prior to the stress, and by pretreatment of the mice with 5mg/kg reserpine given twice 20 and 15 hours prior to the stress. Clonidine (0.2mg/kg) inhibited the stress induced rise of cGMP by approximately 50%. Both the l-derivative and d-derivative of propranolol (20mg/kg) reduced the level of cGMP in the brains of stressed mice to the same extent, suggesting that this effect is not mediated by blockade of beta receptors. No significant effect was observed when the mice were pretreated with atropine (1mg/kg), phentolamine (10mg/kg) and cyproheptadine (1mg/kg). (Author abstract modified)

251419 Rauws, A. G.; Olling, M. Laboratory of Pharmacology, National Institute of Public Health, P.O. Box 1, Bilthoven, The Netherlands. Treatment of experimental imipramine and desipramine poisoning in the rat. *Archives for Toxicology* (Berlin). 35(2):97-106, 1976.

The influence of orally administered activated charcoal on organ concentrations of parenteral imipramine and desipramine is investigated in rats. Ancillary distribution experiments indicated that the gastrointestinal cycle of these substances might be more important than the enterohepatic cycle. Nevertheless the effectiveness of repeated activated charcoal dosage in lowering antidepressant concentrations in visceral organs is found to be unpredictable. This is interpreted as a consequence of predominant binding of these drugs in the tissues, in contrast to drugs like acetosal and the barbiturates, which are distributed more evenly in the body water. It is concluded that activated charcoal has only limited value as an antidotal adsorbent in imipramine or desipramine poisoning. 28 references. (Author abstract)

251429 Colpaert, Francis C.; Niemegeers, Carlos J. E.; Janssen, Paul A. J. Department of Pharmacology, Janssen Pharmaceutica Research Laboratoria, B-2340 Beerse, Belgium. On the ability of narcotic antagonists to produce the narcotic cue. *Journal of Pharmacology and Experimental Therapeutics*. 197(1):180-187, 1976.

The ability of narcotic antagonists to produce the narcotic cue is investigated in rats trained to discriminate fentanyl (0.04mg/kg) from solvent. The partial antagonists pentazocine, cyclazocine and nalorphine were found to possess narcotic cueing activity whereas naloxone lacked any such action at doses up to 160mg/kg. The relationship between the present findings and the ability of these drugs to produce opiate-like subjective effects in humans is discussed. It is concluded that the experimental procedure used may contribute significantly to the preclinical evaluation of drug abuse liability. 41 references. (Author abstract)

251432 Gumulka, S. W.; Dinnendahl, V.; Peters, H. D.; Schonhofer, P. S. Institut für Pharmakologie, Abteilung II, Medizinische Hochschule Hannover, Karl-Wiechert-Allee 9, D-3000 Hannover 61, Germany Effects of dopaminergic stimulants on cyclic nucleotide levels in mouse brain in vivo. *Naunyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 293(1):75-80, 1976.

The hypothesis that cyclic GMP may be involved generally in fast adaptive processes (arousal reaction) of the central nervous system is tested in mice. Behavioral and neurochemical effects of injections of dopaminergic stimulants were investigated. It was found that cyclic GMP levels were increased in the medial forebrain and cerebellum in injected animals. Cyclic AMP levels were not significantly altered under these conditions. Drug induced stereotyped behavior correlated in intensity and duration to the changes in cyclic GMP levels in the medial forebrain. Amantadine, apomorphine and nomifensine showed a linear dose response relationship, but differed as to the extent and time course of the increase in cyclic GMP. Amantadine and apomorphine were more effective in elevating cyclic GMP in the medial forebrain than in the cerebellum. Amphetamine produced an exponential dose related elevation of cyclic GMP in both parts of the brain, being more effective in the cerebellum than in the medial forebrain at high doses, thus indicating a complex mechanism of action. L-Dopa (50mg/kg) and benserazide (40mg/kg) alone did neither significantly increase cyclic GMP levels nor induce stereotyped behavior. However, in animals pretreated with benserazide

(15 min prior to L-dopa) L-dopa produced a significant elevation of cyclic GMP and stereotyped behavior. 24 references. (Author abstract)

251433 Satoh, M.; Zieglansberger, W.; Herz, A. Max Planck-Institut für Psychiatrie, Abteilung Neuropsychiatrie, D-8000 Munich 40, Kraepelinstrasse 2, Germany Supersensitivity of cortical neurones of the rat to acetylcholine and L-glutamate following chronic morphine treatment. *Naunyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 293(1):101-103, 1976.

An experimental investigation of evidence that certain structures in the central nervous system become supersensitive to dopamine during chronic morphine treatment is reported. The effect of microelectrophoretically applied L-glutamate and acetylcholine on discharge activity of cortical neurons was studied in naive and in morphine tolerant/dependent rats. The thresholds for increase in discharge activity elicited by these two putative neurotransmitters were three times lower in the tolerant/dependent rats than in the naive rats, indicating the development of supersensitivity. 22 references. (Author abstract modified)

251434 Otten, U.; Thoenen, H. Department für Pharmakologie, Biozentrum der Universität Basel, Klingelbergstrasse 70, CH-4056 Basel, Switzerland Lack of correlation between changes in cyclic nucleotides and subsequent induction of tyrosine hydroxylase in rat adrenal medulla. *Naunyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 293(1):105-108, 1976.

Pretreatment of rats with dexamethasone (2.5micromoles/kg, a dose which blocks the release of ACTH from the pituitary gland) abolished the reserpine-mediated increase in cAMP and the increase in the cAMP/cGMP ratio in the adrenal medulla. In contrast, the reserpine-mediated induction of tyrosine hydroxylase (TH) remained unchanged. Hypophysectomy had a similar effect to dexamethasone treatment. Since changes in cAMP and changes in the cAMP/cGMP ratio are not indispensable prerequisites for the subsequent induction of TH, it is concluded that a causal relationship between the two phenomena seems to be ruled out. 27 references. (Author abstract)

251534 Spaulding, Theodore C.; Dewey, William L. Department of Pharmacology, School of Medicine, University of North Carolina, Chapel Hill, NC 27514 Some effects of the behaviorally active drug, phenitron, a purported hashish and LSD antagonist, on brain noradrenergic and serotonergic systems. *Research Communications in Chemical Pathology and Pharmacology*. 11(3):503-506, 1975.

The effects of the behaviorally active drug, phenitron, (3-hexahydro-1H-azepin-yl)-3'-nitropropionophenone HCl, on mouse brain noradrenergic and serotonergic systems are examined. Findings indicate that the drug, a purported hashish and LSD antagonist, has no effect on brain norepinephrine levels but decreases serotonin levels and serotonin turnover rate. It is concluded that: 1) either the bizarre behavioral effect noted in cats and dogs and/or the drug's general depressant action may result from its effects on brain serotonergic systems; 2) phenitron's effect on serotonin levels probably occurs on some event in the synthesis of the neurotransmitter; 3) p-chlorophenylalanine, which depletes serotonin through inhibiting tryptophan hydroxylase, also reduces the pargyline induced increase in serotonin, whereas another serotonin depletor, reserpine, does not affect serotonin increases; and 4) phenitron differs from reserpine in that, like p-chlorophenylalanine, it does not cause a decrease in brain norepinephrine levels. 6 references.

251700 Tuomisto, Jouko; Tuomisto, Leena; Pazdernik, Thomas L. Department of Pharmacology, University of Helsinki, Helsinki, Finland **Conformationally rigid amphetamine analogs as inhibitors of monoamine uptake by brain synaptosomes.** *Journal of Medicinal Chemistry*. 19(5):725-727, 1976.

An investigation of the action of conformationally rigid amphetamine analogs as inhibitors of monoamine uptake by brain synaptosomes is reported. These compounds Four 3-phenyl-2-amino-trans-decalin isomers were synthesized in order to obtain derivatives of phenylethylamine with a rigid conformation between the phenyl ring and the amino function. The stereoisomers were tested as inhibitors of catecholamine uptake by rat brain synaptosomes, and their potency was compared with that of amphetamine. The most potent inhibitor of catecholamine uptake was the diaxial 2(a)-amino-3(a)-phenyl-trans-decalin, which was one fourth to one third as potent as (+)-amphetamine. As a dopamine uptake inhibitor in the striatum, this compound was competitive. The results differ from those obtained earlier with similar analogs with a norepinephrine moiety incorporated into the decalin structure, since a gauche derivative (2(a)-amino-3(e)-3, 4-dihydroxyphenyl-3-trans-decalol) was then the most potent and over 20 times as potent as the diaxial antiderivative. It remains to be seen whether this indicates that the mode of binding of phenylethylamines is different from that of catecholamines. 8 references. (Author abstract modified)

251703 Ginsborg, B. L.; Turnbull, K. W.; House, C. R. Department of Pharmacology, University of Edinburgh, 1 George Square, Edinburgh EH8 9JZ, Scotland **On the actions of compounds related to dopamine at a neurosecretory synapse.** *British Journal of Pharmacology (London)*. 57(1):133-140, 1976.

The effects of a number of substances related to dopamine, including all its methylated derivatives, were investigated on the membrane potential and response to nerve stimulation of cockroach salivary gland cells. It was found that only N-methyltyramine (epinine), N,N-dimethyltyramine and N,N-dimethylnoradrenaline, all with unsubstituted hydroxyl groups, directly resembled dopamine in producing a hyperpolarization which could be as large as that caused by maximal nerve stimulation. During the continued presence of these substances the hyperpolarization waned and responses to nerve stimulation declined. Many of the compounds caused one or both of two other effects, namely an increase in the rate of spontaneous miniature hyperpolarizations and an enhancement of the submaximal responses to single nerve stimuli. There were no obvious structural requirements for these effects. 33 references. (Author abstract)

251705 Bevan, P.; Bradshaw, C. M.; Szabadi, E. Department of Psychiatry, University of Manchester, Stopford Building, Oxford Road, Manchester, M13 9PT, England **Potentiation by desipramine of neuronal responses to mescaline.** *British Journal of Pharmacology (London)*. 57(1):152-154, 1976.

The effect of desipramine on responses of single cortical neurons to mescaline was studied by the microelectrophoretic technique in the cat and rat. Both potentiation and antagonism of responses to mescaline by desipramine were observed. It is thought that the antagonism may be related to the alpha-adrenolytic action of desipramine. The potentiation is unlikely to reflect the uptake blocking action of desipramine, since desipramine does not block the uptake of mescaline in the cerebral cortex. It is suggested that the potentiation may be due to a postsynaptic action of desipramine. 11 references. (Author abstract)

251820 Muravchick, Stanley; Bergofsky, Edward H. Department of Physiology, New York University School of Medicine, New York, NY 10003 **Adrenergic receptors and vascular resistance in cerebral circulation of the cat.** *Journal of Applied Physiology*. 40(5):797-804, 1976.

A study is reported in which infusion of catecholamines and pharmacologic blockade were used to demonstrate the presence of an adrenergic receptor system with both alpha and beta components in the feline cerebral vasculature. For this purpose, the anatomically isolated brain preparation was perfused under controlled constant pressure conditions to eliminate active autoregulatory changes and passive fluctuations in calculated cerebral vascular resistance (CVR) secondary to alterations of perfusion pressure. Alpha adrenergic activity was demonstrated as substantial cerebral vasoconstriction in response to infusions of l-norepinephrine and epinephrine; cerebral blood flow (CBF) was decreased by mean values of 25% and 29%, respectively, with calculated increases in CVR of 82% and 62%, respectively. Marked reductions in the vasoconstriction produced by these two catecholamines followed the use of the alpha receptor blocking drug, phenoxybenzamine. Isoproterenol consistently produced cerebral vasodilation (mean CVR decrease of 22%), and this vasodilation was blocked during infusion of a specific beta adrenergic blocking agent, propranolol. Histamine vasodilation (mean CBF increase 49%) appeared to be independent of the classic adrenergic mechanisms. The observed responses are explained on the basis of a functionally significant cerebrovascular adrenergic system having high specificity and demonstrating considerable potency. The data also indicate a predominance of alpha over beta adrenergic cerebrovascular reception. 34 references. (Author abstract modified)

251905 Edgarian, H.; Altura, B. M.; Altura, B. T. Dept. of Anesthesiology, State University of New York Downstate Medical Center, Brooklyn, NY 11203 **Differential effects of ethyl alcohol on contraction of arterial smooth muscle.** *Bulletin of the New York Academy of Medicine*. 52(4):489-490, 1976.

The effects of different concentrations of ethanol (ETH) on reactivity of isolated rat aortic blood vessels to various contractile agents are studied. It is noted that depending on the concentration, ETH can inhibit development of spontaneous mechanical (contractile) activity; induce contraction of aortic strips in calcium free solutions as well as potassium rich, calcium free solutions containing EGTA; potentiate or inhibit contractions induced by epinephrine and vasopressin; displace the dose/response curves of these vasoactive agents to the left or right of the control concomitant with increases or decreases of the maximum contractile responses; attenuate contractions induced by potassium; and inhibit calcium induced contractions of potassium depolarized aortic strips of the rat. The data suggest that low concentrations of ETH (equal to one or two ounces of this alcohol in man) may increase excitability of arterial smooth muscle, that intermediate concentrations may decrease excitability by at least two different mechanisms, and that high concentrations (equal to those used to induce surgical anesthesia in mammals) markedly decrease the excitability of arterial smooth muscle.

251964 Walker, Jonathan; Goodman, Patsy; Jacobs, Donald; Lewin, Edward. no address **Uptake and release of norepinephrine by slices of rat cerebral cortex: effects of agents which increase cyclic AMP levels.** *Neurology*. 4(26):385, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, slices of rat cerebral cortex were incubated with several agents known to

increase levels of cyclic AMP. Dibutyrylcyclic AMP, aminophylline, and adenosine produced significant increases in uptake of norepinephrine at concentrations ranging from 10(-7) to 10(-4) M, and a small but not significant increase in uptake was noted with papaverine. Prostaglandins E1 and E2 could not be used because the alcohol used to dissolve them proved to be a potent inhibitor of norepinephrine uptake. None of the agents caused a significant effect on basal or high potassium (55mM) stimulated release. No other group of drugs is known to cause a selective increase in norepinephrine uptake in cortex or other central or peripheral nervous tissues. Increased uptake of norepinephrine by presynaptic elements would be expected to decrease the amount of norepinephrine available at postsynaptic noradrenergic receptor sites. Since norepinephrine has been found to exert primarily inhibitory effects in the central nervous system, the result of uptake inhibition might well be net excitation. Such an effect might account for the central nervous system stimulation observed with these drugs. (Author abstract modified)

251983 Gerald, Michael C.; Richter, Nancy A. Division of Pharmacology, College of Pharmacy, Ohio State University, Columbus, OH 43210 *Studies on the effects of histaminergic agents on seizure susceptibility in mice.* *Psychopharmacologia* (Berlin). 46(3):277-282, 1976.

The influence of pharmacological modifications of the functional activity of the central histaminergic system was studied on the susceptibility of mice to pentylenetetrazol induced minimal (clonic) and maximal (tonic) seizures. Enhancement in the functional activity of the system by central administration of histamine or 4-methylhistamine or peripheral L-histidine loading failed to modify the risk of seizures. By contrast, reduction in histaminergic function was found to alter seizure susceptibility. Brocresine, an inhibitor of histamine synthesis, decreased and increased the risk of pentylenetetrazol induced minimal and maximal seizures, respectively. Many, but not all, classical antihistamines (H1 antagonists) and metiamide (H2 antagonist) increased minimal seizure susceptibility after peripheral and intraventricular administration, respectively. 30 references. (Author abstract)

252012 Segal, Menahem; Bloom, Floyd E. Isotope Department, Weizmann Institute of Science, Rehovot, Israel *The action of norepinephrine in the rat hippocampus. III. Hippocampal cellular responses to locus coeruleus stimulation in the awake rat.* *Brain Research* (Amsterdam). 107(3):499-511, 1976.

The behavioral and physiological effects of electrical stimulation of the nucleus locus coeruleus (LC) were studied in the awake rat. LC electrodes consistently supported high rates of self-stimulation (SS). LC stimulation also inhibited spontaneous cellular discharges in the hippocampus (HPC). Both the LC induced inhibition of HPC units and the LC evoked SS behavior were antagonized by alpha-methyltyrosine and 6-hydroxydopamine. In addition, chlorpromazine and diethylthiocarbamate antagonized LC induced inhibition of HPC units. D-Amphetamine facilitated SS behavior and reduced spontaneous HPC unit activity. The reinforcing properties of LC stimulation correlate closely with inhibition of cellular activity in the hippocampus; both actions appear to be mediated by norepinephrine. 22 references. (Author abstract)

252018 Lauder, Jean M.; Krebs, Helmut. Department of Biobehavioral Sciences, University of Connecticut, Storrs, CT 06268 *Effects of p-chlorophenylalanine on time of neuronal origin during embryogenesis in the rat.* *Brain Research* (Amsterdam). 107(3):638-644, 1976.

The effects of p-chlorophenylalanine (CPA) on time of neuronal origin during rat embryogenesis were studied to test the hypothesis that monoamine (MA) cells of the nucleus locus coeruleus, raphe nuclei, and substantia nigra regulate the onset of differentiation (time of origin) of cells to which they will ultimately project in the adult. Findings indicate that CPA treatment delayed the onset of neuronal differentiation in brain regions reported to receive serotonin innervation in the adult. Whether or not these effects result from specific serotonin depletion in the developing axons of serotonergic neurons remains to be established. Preliminary results are consistent with the notion that monoamines may be involved in neuroembryogenesis regulation. In conjunction with research to determine the amount of serotonin depletion and the effects of tryptophan administration or serotonin replacement therapy, it is felt that findings may provide a model system within which to test this hypothesis. 48 references.

252023 Moffat, Joyce A.; Jhamandas, Khem. Department of Pharmacology, Faculty of Medicine, Queen's University, Kingston, Ontario, Canada *Effects of acute and chronic methadone treatment on the uptake of 3H-5-hydroxytryptamine in rat hypothalamus slices.* *European Journal of Pharmacology* (Amsterdam). 36(2):289-297, 1976.

Effects of in vitro methadone and several other narcotics were investigated on 3H-5-HT uptake in rat hypothalamus slices. The results indicated that d,l-methadone and levorphanol had slightly greater inhibitory action on the uptake than the isomers, d-methadone and dextrorphan, respectively. Morphine, diacetylmorphine and the narcotic antagonist naloxone produced a considerably weaker inhibitory effect. After an acute injection of methadone, but not morphine, the uptake of 5-HT by hypothalamic slices of treated animals was inhibited. The chronic treatment of rats with methadone for 18 days had no significant effect on the uptake, but following the withdrawal of this treatment for 2 weeks the 5-HT uptake was significantly elevated. The inhibitory effects of in vitro methadone in hypothalamus slices were not modified by the chronic drug treatment. 31 references. (Author abstract)

252024 Martin, Gregory E.; Myers, Robert D.; Newberg, Dale C. Laboratory of Neuropsychology, Purdue University, Lafayette, IN 47907 *Catecholamine release by intracerebral perfusion of 6-hydroxydopamine and desipramine.* *European Journal of Pharmacology* (Amsterdam). 36(2):299-311, 1976.

The rate of catecholamine release was examined at perfusion sites in the diencephalon of the unanesthetized rat during the perfusion of a solution of 6-hydroxydopamine (6-OHDA) or desipramine (DMI). Endogenous stores of norepinephrine (NE) and dopamine (DA) were first tagged by the cerebral microinjection of 14C or 3H labelled NE or DA. After successive control perfusates were collected with a push/pull cannula system, 6-OHDA, in a concentration of 5.0, 0.5 or 0.1 mg/ml, was perfused at 20 to 23 min through a site in the rat's brain. The compound induced a dose related release of both NE and DA. In control experiments, 6-OHDA exerted a nonspecific releasing effect on 3H-inulin which was not dose dependent. In addition, DMI, an NE reuptake inhibitor in a concentration of 10.02 or 0.5 mg/mg, was perfused through 23 sites in the brain following the injection of labelled NE. DMI enhanced the recovery of NE in the push/pull effluent at the 10.0 mg/ml concentration only. However, an augmented efflux of 3H-inulin was also observed during the perfusion of the highest concentration of DMI. These results support the view that 6-OHDA releases catecholamines from endogenous storage sites, but also indicate a strong nonspecific releasing action of

this compound possibly at extracellular or noncatecholaminergic loci. 31 references. (Author abstract)

252025 Drew, Geoffrey M. Department of Pharmacology, Allen and Hansburys Research Ltd; Ware, Hertfordshire SG12 0DJ, England **Effects of alpha-adrenoceptor agonists and antagonists of pre- and postsynaptically located alpha-adrenoceptors.** *European Journal of Pharmacology (Amsterdam)*. 36(2):313-320, 1976.

The effects of alpha-adrenoceptor agonists and antagonists have been examined at presynaptically and postsynaptically located alpha-adrenoceptors in the pithed rat. The presynaptic receptors were those located at the cardiac sympathetic nerve terminals and the postsynaptic receptors were those present in vascular smooth muscle. Clonidine was approximately equipotent at presynaptic and postsynaptic alpha-adrenoceptors, while LSD and BAY-1470 were more active at the presynaptic than at postsynaptic sites. Oxymetazoline, naphazoline, methoxamine and phenylephrine were all much more active at the postsynaptic alpha-adrenoceptors. Phenolamine was the most potent antagonist at both presynaptic and postsynaptic alpha-adrenoceptors. Piperoxan, yohimbine and tolazoline were about 3 to 7X less potent than phenolamine at both sites. Thymoxamine was about 10X less potent than phenolamine at postsynaptic alpha-adrenoceptors but about 1000X less active at the presynaptic receptors. The differential actions of both agonists and antagonists at presynaptic and postsynaptic alpha-adrenoceptors suggest that the receptors may be of different types. 19 references. (Author abstract)

252026 Paalzow, Gudrun; Paalzow, Lennart. Department of Pharmacology, Pharmaceutical Faculty, Biomedical Center, Univ. of Uppsala, Box 573, S-751 23 Uppsala, Sweden **Evaluation of the antinociceptive effects of 4, alpha-dimethyl-m-tyramine (H77/77) in the rat.** *European Journal of Pharmacology (Amsterdam)*. 36(2):321-329, 1976.

A study was conducted to investigate whether 4, alpha-dimethyl-m-tyramine (H77/77), a potent releaser of central catecholamine stores, possessed any antinociceptive effects and further, to compare these responses with those obtained earlier with morphine and clonidine. H 77/77 has been shown to induce dose dependently antinociceptive activity against three parameters: 1) the motor (M), 2) the vocalization during stimulation (V) and 3) the vocalization after withdrawal of stimulation (VA) responses. The effect of H 77/77 upon the V and VA pain responses was abolished or reduced by prior treatment with phenoxybenzamine, chlorpromazine, H 44/68, FLA 63, reserpine and protriptyline, and was potentiated by atropine sulphate. It is suggested that H77/77 may exert its inhibitory effect on painful stimulation predominantly by inhibiting spinal sensory input. 30 references. (Author abstract modified)

252027 Kogan, Frederick J.; Nichols, William K.; Gibb, James W. Department of Pharmacology, College of Pharmacy and Medicine, University of Utah, Salt Lake City, UT 84112 **Influence of methamphetamine on nigral and striatal tyrosine hydroxylase activity and on striatal dopamine levels.** *European Journal of Pharmacology (Amsterdam)*. 36(2):363-371, 1976.

To elucidate further the mechanism by which methamphetamine depresses tyrosine hydroxylase (TH) activity, enzyme activity was measured in the rat corpus striatum and substantia nigra after repetitive and single dose methamphetamine administration. Following repeated doses of methamphetamine, nigral TH activity decreased and reached

45% of controls at 12 hr and returned to normal at 60 hr. Striatal TH activity decreased to 40% of control at 36 hr and returned toward normal at 60 hr. When methamphetamine was administered every 6 hr for 30 hr and then discontinued, nigral TH activity returned toward control levels 4 days prior to recovery of striatal TH activity. Methamphetamine initially increased striatal dopamine levels at 6 hr (170% of control). Dopamine levels then decreased in parallel with striatal TH activity but failed to increase as the enzyme recovered. Concurrent administration of chlorpromazine with methamphetamine prevented the methamphetamine induced decrease in nigral and striatal TH activity and striatal dopamine levels. The results indicate that the methamphetamine induced depression of striatal and nigral TH activity may be related to increased stimulation of dopamine receptors in the striatum. 34 references. (Author abstract modified)

252031 Costall, Brenda; Naylor, Robert J. Postgraduate School of Studies in Pharmacology, University of Bradford, Bradford, West Yorkshire, England **Dissociation of stereotyped biting responses and oro-bucco-lingual dyskinesias.** *European Journal of Pharmacology (Amsterdam)*. 36(2):423-429, 1976.

A comparison was made of the doses of neuroleptic and related agents required to inhibit the stereotyped biting/gnawing/licking response induced in the guinea pig by systemically administered apomorphine and d-amphetamine or by dopamine administered bilaterally into the striatum. Haloperidol, lenperone, fluphenazine (0.5 to 8 mg/kg i.p.) and fluspirilene (0.12 to 8 mg/kg i.p.) each inhibited the stereotyped behavior induced by apomorphine and amphetamine but doses up to 16 mg/kg i.p. failed to modify the dyskinesias induced by intrastriatal dopamine. Pimozide similarly abolished the stereotypies (0.125 to 8 mg/kg i.p.) but a larger dose (16 mg/kg i.p.) also abolished the dopamine induced dyskinesias. However, oxiperamide and spiroxatrine were both shown to possess marked antidyskinetic (1 to 2 mg/kg i.p.) as well as antistereotypic (0.25 to 2 mg/kg i.p.) properties. Thioridazine, clozapine, clozapine, sulpiride and metoclopramide were generally inactive against the stereotypies and dyskinesias although 1.25 to 5 mg/kg s.c. morphine effectively abolished stereotyped behavior and the dopamine induced dyskinesias were inhibited in a small proportion of animals. It is suggested that the dopamine mechanisms involved with stereotypy induction differ from those activated by intrastrially administered dopamine to induce abnormal orofacial movements, and that, since only the effects of intrastriatal dopamine showed the same relative degree of resistance to neuroleptic inhibition as clinical dyskinesias, that this may be more applicable to the clinical situation than the stereotypy model. 17 references. (Author abstract)

252033 Broekkamp, Chris L.; Van Den Bogaard, Jan H.; Heijnen, Hilly J.; Rops, Ron H.; Cools, Alexander R.; Van Rossum, Jacques M. Department of Pharmacology, University of Nijmegen, Geert Grooteplein Noord 21, Nijmegen, The Netherlands **Separation of inhibiting and stimulating effects of morphine on self-stimulation behaviour by intracerebral microinjections.** *European Journal of Pharmacology (Amsterdam)*. 36(2):443-446, 1976.

The effects of self-stimulation behavior of 5 microg morphine HCl applied into the ventricular system and into different areas throughout the brain of the rat were studied. Injections into the ventricular system and in areas intermediate between the posterior hypothalamus and the periaqueductal gray matter had biphasic effects: an inhibition followed by an excitation. Injections into the posterior hypothalamus resulted

in increased self-stimulation whereas injections into the periaqueductal gray matter and into the locus coeruleus were only inhibiting. 10 references. (Author abstract)

252034 Nistico, Giuseppe; Stephenson, John D.; Preziosi, Paolo. Institute of Pharmacology, 2nd Faculty of Medicine, University of Naples, Italy **Behavioural, electrocortical and body temperature effects of cholera toxin**. *European Journal of Pharmacology* (Amsterdam). 36(2):459-462, 1976.

The effects of cholera toxin on behavior, electrocortical activity and body temperature of both young and adult fowls were studied. In young chicks intrahypothalamic infusion of cholera toxin produced a dramatic and dose dependent increase in motor activity. Similar effects were also obtained in adult fowls after injection of cholera toxin into the third cerebral ventricle, the hypothalamus or the paleostriatum augmentatum. Electrocortical changes consisted of a slight desynchronization during the hypermotor activity and were preceded, when the highest intraventricular doses were used, by a short period of slower frequency and higher amplitude potentials. Intraventricular and intrahypothalamic but not intrastriatal injection of cholera toxin produced a typical biphasic hyperthermic response. It is concluded that cholera toxin given into the brain seems to be a new tool for the study of the molecular mechanisms mediating central dopaminergic functions. 10 references. (Author abstract modified)

252170 Hoffman, W. E.; Phillips, M. I. Neurobehavior Laboratory, Department of Physiology and Biophysics, University of Iowa, Iowa City, IA 52242 **The effect of subfornical organ lesions and ventricular blockade on drinking induced by angiotensin II**. *Brain Research* (Amsterdam). 108(1):59-73, 1976.

The role of the subfornical organ (SFO) as the unique receptor site for the drinking behavior induced by intracranial injections of angiotensin 2(A2) was investigated. It was found that: 1) drinking in response to intraventricular (IVT) injections of A2 was reduced in six rats but was unchanged after 80% to 100% damage of the SFO in four cases; 2) reduction of drinking to lateral ventricular application of A2 was seen with no apparent SFO damage in four rats; 3) recovery of the A2 induced drinking deficit was consistently observed within a short time interval (14 days), even in those animals with complete SFO lesions; 4) the presence of ventricular debris was correlated with deficits in water intake to IVT angiotensin injections. In a second experiment, artificial blockade of the ventricular space was produced by a plugging technique. Plugging the anterior third ventricle simulated the effects of SFO lesioning. It is concluded that the SFO is not a unique receptor area since the ventral anterior third ventricle is also sensitive for A2 (IVT) induced drinking. If the SFO is a receptor site for A2 circulating in the CSF, it is probably not the only periventricular receptor site. Access of A2 to the anterior ventral third ventricle appears to be essential for inducement of drinking. 19 references. (Author abstract)

252173 Lorens, Stanley A.; Guldberg, Hans C.; Hole, Kjell; Kohler, Christer; Srebro, Bolek. Department of Pharmacology, Institute of Physiology, University of Bergen, Bergen, Norway **Activity, avoidance learning and regional 5-hydroxytryptamine following intra-brain stem 5,7-dihydroxytryptamine and electrolytic midbrain raphe lesions in the rat**. *Brain Research* (Amsterdam). 108(1):97-113, 1976.

A study is reported which was undertaken to compare in mice some behavioral and biochemical effects of intrabrain-stem 5,7-dihydroxytryptamine (5,7-DHT) injections with those

produced by electrolytic damage to the midbrain raphe nuclei. Regional 5-hydroxytryptamine (5-HT) levels were greatly reduced following 5,7-DHT administration and electrolytic raphe lesions. The 5,7-DHT rats also showed a reduction in spinal 5-HT content. Central catecholamine (CA) concentrations were not affected. Variation in the pattern of regional 5-HT changes after 5,7-DHT treatment was observed but appeared to be related to the adequacy of the dorsal raphe (B7) injection. Only the electrolytic raphe lesion animals, however, showed increased locomotor activity and retarded acquisition and forced extinction of the one way avoidance response. In contrast, no significant differences were observed in the open field and avoidance behavior of the 5,7-DHT, vehicle, and control groups. The hyperactivity and impaired one way avoidance performance observed after electrolytic midbrain raphe lesions are not related simply to reductions in regional forebrain 5-HT and may well be due to damage of non-serotonergic neural systems. Clearly, the behavioral effects of central 5-HT depletion depend on the method employed. The role of 5-HT in regulating activity level and mediating avoidance behavior, furthermore, remains to be determined. 31 references. (Author abstract modified)

252174 Cantor, Arthur; Satinoff, Evelyn. School of Medicine, Box 365, University of Pennsylvania, Philadelphia, PA 19174 **Thermoregulatory responses to intraventricular norepinephrine in normal and hypothalamic-damaged rats**. *Brain Research* (Amsterdam). 108(1):125-141, 1976.

An examination of the effects of intraventricular injection of low doses of norepinephrine (NE) on internal temperature and on behavioral and reflexive thermoregulatory responses in unrestrained rats is reported. NE lowered the body temperature of the rats in cold and neutral environments but had little effect in the heat. The hypothermia was blocked by alpha-adrenergic antagonists but unchanged by beta-adrenergic antagonists. In the cold, the hypothermia was caused primarily by a lowered metabolic rate. At ambient temperature 25 degrees C, it was caused primarily by vasodilatation while metabolic rate increased. Thus, reflexive responses were not integrated to lower body temperature. Behavioral responding compensated for the hypothermia. In the cold, rats increased responding to get heat after NE. In a warm environment, they did not increase responding to escape heat. Thus, both reflexive and behavioral results support the idea that the set point is unchanged after intraventricular NE. As ablation of the preoptic/anterior hypothalamic area resulted in a greatly exaggerated hypothermia in response to NE, it is concluded that NE does not act in this area. 28 references. (Author abstract modified)

252178 Medzihradsky, Fedor. Department of Pharmacology, Stanford University School of Medicine, Stanford, CA 94305 **Stereospecific binding of etorphine in isolated neural cells and in retina, determined by a sensitive microassay**. *Brain Research* (Amsterdam). 108(1):212-219, 1976.

The stereospecific binding of etorphine, which reflects interaction of narcotic drugs with opiate receptor, was studied in rats' isolated neural cells and retina using a sensitive microassay. Cellular differentiation of such opiate receptor binding in brain was determined by measuring stereotypic interaction with etorphine, the most potent morphine like analgesic, in isolated neuronal and glial cells and in retina, a CNS tissue containing several specialized neuron types with no reported sensitivity towards narcotic drugs (levorphanol, morphine, naloxone, and dextrorphan). Although evidence for the presence of opiate receptor in glia was obtained, it is contended that the possible contribution to opiate receptor binding

in these cells by contaminants of neuronal origin cannot be ruled out. Findings in retina showed stereospecific binding of etorphine equaling 70% of that in cortical homogenates and a ratio of specific to nonspecific interaction markedly higher than in any of the investigated CNS tissue preparations. It is concluded that the retina has no apparent physiological correlates to the considerable capacity it displayed for opiate receptor binding. 21 references.

252198 Smith, D. F. Psychopharmacology Research Unit, Psychiatric Hospital, Risskov, Denmark Lithium orotate, carbonate and chloride: pharmacokinetics, polydipsia and polyuria in rats. *British Journal of Pharmacology* (London). 56(4):399-402, 1976.

An experimental comparison of the pharmacokinetics and the polydipsia and polyuria inducing properties of the lithium ion administered as lithium orotate, lithium carbonate, and lithium chloride in the rat is reported. No differences in the uptake, distribution and excretion of the lithium ion were observed between lithium orotate, lithium carbonate and lithium chloride after single intraperitoneal, subcutaneous or intragastric injections (0.5 to 1.0 mEq lithium/kg) or after administration of the lithium salts for 20 days in the food. It is observed that these findings oppose the notion that the pharmacokinetics of the lithium ion given as lithium orotate differ from lithium chloride or lithium carbonate. Polyuria and polydipsia developed more slowly in rats given lithium orotate than in those given lithium carbonate or lithium chloride. It is suggested that this effect might be the result of the orotate anion. 12 references. (Author abstract modified)

252200 Egan, Sandra M.; Graham, J. D. P.; Lewis, M. J. Department of Pharmacology, Welsh National School of Medicine, Heath Park, Cardiff, CF4 4XN, Wales The uptake of tritiated delta-1-tetrahydrocannabinol by the isolated vas deferens of the rat. *British Journal of Pharmacology* (London). 56(4):413-416, 1976.

A study of the uptake of tritiated delta-1-tetrahydrocannabinol by the isolated vas deferens of the rat is reported. Weighed stripped vasa deferentia were incubated in Holman's solution containing either (14C)-sorbitol, (3H)-noradrenaline (3H-NA), or (3H)-tetrahydrocannabinol ((3H)-delta-1-THC) for 5, 10, 20 and 30 minutes. Tissues were washed, dissolved in Protosol, counted by standard scintillation counting technique and drug space. Vasa incubated for 30 min with (14C)-sorbitol were washed for varying lengths of time; 82% clearance had taken place after two washes of 5 minutes. The uptake of (3H)-NA was inhibited by the presence of desmethylimipramine (DMI) 10 nM in the bath or by pretreatment of rats with 6-hydroxydopamine (6-OHDA). The uptake of (3H)-delta-1-THC was not inhibited by the presence of DMI, and it was reduced but not abolished by 6-OHDA pretreatment. 5 references. (Author abstract modified)

252201 Carruba, M. O.; Groppetti, A.; Mantegazza, P.; Vicentini, L.; Zambotti, F. Department of Pharmacology, School of Medicine, University of Milan, Via Vanvitelli 32, 20129, Milano, Italy Effects of mazindol, a non-phenylethylamine anorexigenic agent, on biogenic amine levels and turnover rate. *British Journal of Pharmacology* (London). 56(4):431-436, 1976.

An investigation of the effects of Mazindol, a new anorexigenic agent which possesses a different chemical structure from that of phenylethylamines, is reported. Mazindol neither altered whole brain monoamine levels (noradrenaline (NA), dopamine, 5-hydroxytryptamine (5-HT)) nor changed NA levels in the hypothalamus or dopamine levels in the caudate

nucleus. Mazindol enhanced dopamine turnover rate in the caudate nucleus, as shown by the increased rate of dopamine decline after blockade of catecholamine synthesis by alpha-methyl-p-tyrosine, and decreased the conversion index of (3H)-tyrosine into brain NA. Mazindol administration did not modify pargyline induced decline of 5-hydroxyindoleacetic acid suggesting that 5-HT turnover is not altered by this drug. 32 references. (Author abstract modified)

252216 Ursin, Reidun. Institute of Physiology, University of Bergen, Arstadveien 19, N-5000 Bergen, Norway The effects of 5-hydroxytryptophan and L-tryptophan on wakefulness and sleep patterns in the cat. *Brain Research* (Amsterdam). 106(1):105-115, 1976.

Sleep in cats was studied for 24 h after i.p. injections of D,L-5-hydroxytryptophan (5-HTP, 40 mg/kg) or L-tryptophan (200 mg/kg and 300 mg/kg) in two separate experiments. Total sleep, total slow wave sleep or deep slow wave sleep was not changed in either experiment. There was an increase of the awake, drowsy pattern over the whole recording period after both 5-HTP and tryptophan injections. An accentuated drowsy pattern, with high voltage 4 c/sec synchronous waves, but with no sleep spindles, was seen during the first hours after 5-HTP injection. REM sleep was completely absent during the first 6 h after 5-HTP and significantly reduced during the first 3 h after tryptophan. The similarity of the effects of 5-HTP and tryptophan suggests that they both act as serotonin precursors. It is also suggested that the serotonin precursors have a general deactivating effect on the waking state, and that they do not necessarily subserve a specific sleep inducing or sleep maintaining function. 20 references. (Author abstract)

252217 Giorgiuffi, M. F.; Le Floc'h, M. L.; Westfall, T. C.; Glowinski, J.; Besson, M. J. Groupe NB, I.N.S.E.R.M. U 114, Collège de France, 11, place Marcelin Berthelot, Paris 5e, France Nicotinic effect of acetylcholine on the release of newly synthesized (3H)dopamine in rat striatal slices and cat caudate nucleus. *Brain Research* (Amsterdam). 106(1):117-131, 1976.

The effect of acetylcholine (ACh), carbachol and nicotinic blocking agents on the release of newly synthesized (3H)dopamine ((3H)DA) was studied in vitro on rat striatal slices and in vivo on the cat caudate nucleus. In vitro, ACh (10(-5)M) and carbachol (10(-5)M) enhanced the release of (3H)DA (90%). Similar results were obtained in vivo in anesthetized cats. The effect of ACh (10(-5)M) was more pronounced (125%) in presence of eserine (10(-4)M) than with ACh alone (65%). ACh was also effective in unanesthetized cats. The ACh effect on (3H)DA release was reproducible within the same experiment both in vitro and in vivo. This allowed to test the effect of anticholinergic agents on the ACh induced release of (3H)DA. In vivo, hexamethonium (10(-4)M, 10(-5)M), partially blocked the release of (3H)DA induced by ACh (10(-5)M) alone; the effect was not seen when ACh was added in the presence of eserine (10(-4)M). Both in vivo and in vitro, the prior introduction of mecamylamine into the superfusing medium antagonized the stimulating effect of ACh (10(-5)M) on (3H)DA release. The effects of this nicotinic blocking agent were seen with various concentrations (10(-6); 10(-5); 10(-4)M) in the in vitro experiments. Data suggest that the release of DA from dopaminergic terminals can be regulated by cholinergic presynaptic receptors exhibiting nicotinic characteristics. The respective role of nicotinic and muscarinic receptors in the release of DA is discussed. From these results, it can be assumed that cholinergic and anticholinergic agents may act on the metabolism of DA in the nigrostriatal DA neurones through their effect on cholinergic presynaptic receptors. 40 references. (Author abstract modified)

252219 Simantov, Rabi; Kuhar, Michael J.; Pasternak, Gavril W.; Snyder, Solomon H. Department of Pharmacology, Johns Hopkins University School of Medicine, Baltimore, MD 21205 The regional distribution of a morphine-like factor enkephalin in monkey brain. *Brain Research (Amsterdam)*. 106(1):189-197, 1976.

In order to evaluate the relationship between enkephalin levels and opiate receptor binding in detail, the distribution of enkephalin activity was studied in 34 areas of the monkey brain. Enkephalin activity was observed to display regional variations. The most marked discrepancies between the distribution of enkephalin and the opiate receptor involve the amygdala. It is concluded that pronounced regional variations in enkephalin activity within the monkey brain confirm its unique properties and support other evidence that enkephalin activity does not simply represent a nonspecific effect. It is thought that enkephalin activity, as with the opiate receptor, is associated with the limbic system of the brain and with extrapyramidal areas. 27 references.

252220 Livrea, Paolo; Di Reda, Lella; Giovine, Angelo; Bertolino, Antonio. Clinica Neurologica, Policlinico, Bari, Italy Effects of tetrahydropapaveroline on dopamine and 5-hydroxytryptamine metabolism in rat brain in vivo. *Pharmacology (Basel)*. 14(1):20-26, 1976.

Results are reported concerning the effects of acute and chronic tetrahydropapaveroline (THP) administration on dopamine (DA) and 5-hydroxytryptamine (5-HT) metabolism in the rat brain. It was found that: 1) in rats given THP, 8 and 60mg/kg acutely, homovanillic acid (HVA) brain levels increased after 2 h, decreased after 4 h, and were normal after 6 h; 2) in rats given THP, 8mg/kg chronically for 10 and 20 days, HVA levels did not change; 3) in rats given THP, 8 and 60mg/kg acutely, 5-hydroxyindoleacetic acid (5-HIAA) brain levels increased after 2 h, and were normal after 4, 6, and 12 h; 4) in rats given THP, 8mg/kg chronically for 10 and 20 days, 5-HIAA levels decreased; 5) in rats treated with L-Dopa, pretreatment with THP (60mg/kg) inhibited the L-Dopa induced HVA increase; and 6) in rats pretreated with PCPA, THP (8mg/kg) induced a smaller decrease in 5-HIAA levels than in controls. In agreement with behavioral effects and with results already obtained in vitro, the data show that THP influences cerebral monoamine metabolism in vivo. It is suggested that this property of THP may be related to certain side-effects of L-Dopa long-term therapy in parkinsonism. 36 references. (Author abstract modified)

252221 Kraynack, Barry J.; Cohn, Major L.; Cohn, Marthe; Taylor, Floyd H. Department of Anesthesiology, Harvard Medical School, Boston, MA Comparisons between the anesthetic action of dibutyl cyclic AMP and analeptic drugs on amobarbital-induced narcosis in the rat. *Pharmacology (Basel)*. 14(1):39-46, 1976.

The anesthetic properties of the heterogeneous group of drugs called analeptics are compared in the rat to those of dibutyl cyclic AMP. Of the analeptic drugs studied (d-amphetamine, picrotoxin, pentyleneetetrazol, caffeine, theophylline, strychnine, ethamivan and doxapram), only picrotoxin demonstrated anesthetic properties. However, picrotoxin was associated with severe toxicity at all dose levels tested. It is concluded that no analeptic drug is effective in reversing the central nervous system depression produced by sedative, hypnotic, or tranquilizer drug overdosage. 20 references. (Author abstract modified)

252222 Back, G.; Seidel, G.; Endell, W. Abteilung für Pharmakologie, Medizinische Hochschule, Lubeck, Germany Effects of caffeine and ethanol on the blood-brain barrier in rats. *Pharmacology (Basel)*. 14(1):67-75, 1976.

An investigation of the effects of caffeine and ethanol on the blood-brain barrier in rats is reported. It is noted that pretreatment with caffeine or ethanol shortens the duration of the harmine tremor and decreases the brain concentrations of this alkaloid. Caffeine and ethanol, however, do not influence the plasma concentration of harmine, its plasma protein binding or its cerebral concentration at the termination of the tremor. The findings are regarded as indicative of a reduction by caffeine and ethanol of the blood-brain barrier permeability to harmine. 20 references. (Author abstract modified)

252223 Vizi, E. S.; Foldes, F. F.; Rich, J.; Knoll, J. Department of Pharmacology, Semmelweis University of Medicine, 1085 Budapest, Hungary The structure-action relationship and kinetics of some naloxone and naltrexone derivatives. *Pharmacology (Basel)*. 14(1):76-85, 1976.

The isolated longitudinal muscle preparation (with attached Auerbach plexus) of the guinea pig ileum was used to investigate the structure activity relationship and kinetics of some naloxone and naltrexone derivatives and that of cyclazocine. The agonist used for the investigation of the antagonistic effect of these compounds was 6-azidomorphine (AM). AM was found to be an about 20 times more potent agonist than morphine. In contrast to cyclazocine, which also was found to be an approximately 15 times more potent agonist than morphine, naloxone and no demonstrable agonistic activity and naltrexone and the various naloxone and naltrexone derivatives had only significant agonistic activity with ED₅₀/K_e ratios ranging from 2,000 to about 120,000. All compounds tested were competitive reversible antagonists of AM. 6-Methylene substitution caused an approximate 50% and 100% increase of the antagonistic activity of naloxone and naltrexone, respectively, and decreased the duration of action of naloxone. 3-Acetate or 3-nicotinate substitution decreased potency and had no effect on the duration of naloxone action. There is a correlation between tachyphylaxis observed on the inhibition of longitudinal muscle contraction and antagonist activity of narcotic agonists. 17 references. (Author abstract)

252514 Knapp, Suzanne; Mandell, Arnold J. Department of Psychiatry, School of Medicine, University of California at San Diego, La Jolla, CA 92093 Cocaine and lithium: neurobiological antagonism in the serotonin biosynthetic system in rat brain. *Life Sciences (Oxford)*. 18(7):679-683, 1976.

The results of an examination of the independent effects of cocaine in vivo and of the lithium/cocaine interaction on serotonergic mechanisms are reported. Cocaine reduced the uptake and conversion of tryptophan to serotonin in rat brain striate tissue and enhanced tryptophan hydroxylase activity in lateral midbrain cell bodies and striate nerve endings. Lithium augmented the uptake and conversion measures and reduced the enzyme activity in cell bodies and nerve endings. The cocaine effects on all four measures were antagonized by three days of lithium pretreatment. Further research on the use of lithium in treating compulsive stimulant users is suggested. 28 references. (Author abstract modified)

252516 Messing, Rita B.; Fisher, Laurel A.; Phebus, Lee; Lytle, Loy D. Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, MA 02139 Interaction of diet and drugs in the regulation of brain 5-hydroxyindoles and the response to painful electric shock. *Life Sciences (Oxford)*. 18(7):707-714, 1976.

Interaction of diet and drugs in rodents' response to painful electric shock is investigated. Long-term consumption of a corn diet poor in tryptophan decreases electroshock response thresholds in rats. This hyperalgesia is traced to diet induced reductions in the brain concentrations of the putative neurotransmitter, serotonin. Rehabilitating corn fed animals by feeding them corn diets supplemented with tryptophan restored brain serotonin and pain thresholds to normal; similarly, injecting the tryptophan deficient animals with fluoxetine, a drug which blocks brain neuron serotonin uptake, also restores the electroshock response thresholds to control levels. The tryptophan hydroxylase inhibitor P-chlorophenylalanine increases the hyperalgesia to electroshock in corn fed rats and further reduces brain serotonin concentrations. Injections of the amino acid valine, on the other hand, produce hyperalgesia and decrease brain serotonin in casein fed rats but not in corn fed rats. The hypothesis that serotonin neurons mediate sensitivity or reactivity to painful stimuli is supported. 13 references. (Author abstract modified)

252519 Cannon, Eleanor; Wyatt, Richard J.; Gillin, J. Christian. Division of Special Mental Health Research, IRP, NIMH, Saint Elizabeths Hospital, Washington, DC 20032 **Potentiation of amphetamine-induced hyperactivity by acute but not by chronic para-chlorophenylalanine treatment in the rat.** Life Sciences (Oxford). 18(7):763-767, 1976.

A study is reported of potentiation of amphetamine induced hyperactivity by acute but not by chronic para-chlorophenylalanine (PCPA) treatment in the rat. Acute pretreatment with PCPA potentiated amphetamine induced hyperactivity. Chronic pretreatment with PCPA failed to produce potentiation of the amphetamine effect. Activity levels were slightly depressed following acute PCPA treatment alone and significantly depressed following chronic PCPA alone. The findings indicate that the acute effects of a drug can be different from its chronic effects. The data may be consistent with the notion that a gradual adjustment to PCPA took place overtime. 15 references. (Author abstract modified)

252521 Dray, A.; Straughan, D. W. Department of Pharmacology, School of Pharmacy, 29/39 Brunswick Square, London WC1N 1AX, England **Benzodiazepines: GABA and glycine receptors on single neurons in the rat medulla.** Journal of Pharmacy and Pharmacology (London). 28(4):314-315, 1976.

Effects of the two benzodiazepines chlorthalidoxepoxide and flurazepam are compared with the effects of GABA and glycine administered directly to the same central neurons in adult albino rat medulla by microiontophoresis. Two antagonists, bicuculline and strychnine were used to determine whether flurazepam interacts with GABA or glycine receptors. Both flurazepam and chlorthalidoxepoxide were reported to be half as potent as GABA or glycine when currents required to produce the same magnitude of depression within the same period of ejection were compared. Interactions with putative transmitters and interactions with bicuculline methochloride or strychnine are discussed. Further studies with flurazepam, which produced most consistent effects, showed that its depressant effects were never selectively modified by strychnine but constantly reduced by bicuculline. 10 references.

252522 Goudie, Andrew J.; Thornton, Everard W.; Wheeler, Timothy J. Department of Psychology, University of Liverpool, P.O. Box 147, Liverpool, L69 3BX, England **Effects of Lilly 110140, a specific inhibitor of 5-hydroxytryptamine uptake, on food intake and on 5-hydroxytryptophan-induced anorexia.**

Evidence for serotonergic inhibition of feeding. Journal of Pharmacy and Pharmacology (London). 28(4):318-320, 1976.

Effects of Lilly 110140, a specific inhibitor of 5-hydroxytryptamine (5-HT) uptake, on food intake and on 5-hydroxytryptophan (5-HTP) induced anorexia in rats are investigated and evidence for serotonergic inhibition of feeding is presented. Rats were allocated to one of the following groups: controls, 5-HTP, Lilly 110140, and Lilly 11040-5-HTP. Results directly implicate serotonergic neurons in the anorectic effects of 5-HTP. Transient anorectic effects of the uptake inhibitor are suggested to be compatible with the concept of a serotonergic system which inhibits food intake although an adequate explanation of the drug's anorectic effects awaits a more definitive neurochemical study. Data reported indicate that effects in previous experiments are mediated by 5-HT neurons. 22 references.

252523 Rollema, Hans; Westerink, Ben H. C.; Grol, Cor J. Laboratory for Pharmaceutical and Analytical Chemistry, Antonius Deusinglaan 2, State University, Groningen, The Netherlands **Correlation between neuroleptic-induced suppression of stereotyped behaviour and HVA concentrations in rat brain.** Journal of Pharmacy and Pharmacology (London). 28(4):321-323, 1976.

The correlation between neuroleptic induced suppression of stereotyped behavior and homovanillic acid (HVA) concentrations in rat brain is explored. The HVA increase was measured after different doses of 11 phenothiazines. Dose response curves were also generated for haloperidol, pimozide and clozapine. Results show that all log dose response curves have about the same slopes, making a comparison of relative potencies by an arbitrary measure possible. Good correlations were found between the ED 50% HVA and the lowest active doses which antagonize apomorphine or amphetamine induced behavioral effects. Antagonism towards stimulation of locomotor activity correlated to the same extent with ED50% HVA as did the suppression of stereotypy. Good correlation between antagonism to hyperactivity and neuroleptic-induced HVA increase indicated that probably dopamine is the predominant catecholamine involved. 18 references.

252711 Hategan, Dora; Constantinescu, Elisabeta. Institute of Neurology and Psychiatry of the Academy of Medical Sciences, Bucharest, Romania **The influence of anticonvulsant drugs on cerebral aspartate aminotransferase activity in mice with predisposition to audiogenic seizures.** Neurologie et Psychiatrie (Bucuresti). 13(4):273-280, 1975.

The cerebral aspartate aminotransferase (AAT) activity of various subcellular compartments in mice with predisposition to audiogenic seizures, as well as the influence on this activity of in vivo administration of phenobarbital and diphenylhydantoin in dosages blocking the audiogenic seizures, are studied comparatively to a common mouse strain. Before administration of the drugs, the AAT activity in the brain of audiogenic mice was higher than in the common strain, excepting the activity in the mitochondria, which suggests a functional deficit at this level. Phenobarbital induced in audiogenic mice a rise in the mitochondrial enzyme activity. Diphenylhydantoin seemed to influence the AAT activity at the level of the mitochondrion metabolic deficit, by tending to diminish it. The data suggest that the effect of anticonvulsant drugs depends on the functional particularity of the animal's cerebral tissue. 38 references. (Author abstract)

252757 Toda, Noboru; Hayashi, Shigehiro; Fu, Wang L. H.; Nagasaka, Yasunori. Department of Pharmacology, Faculty of

Medicine, Kyoto University, Kyoto 606, Japan Serotonin antagonism in isolated canine cerebral arteries. *Japanese Journal of Pharmacology* (Kyoto). 26(1):57-63, 1976.

A comparison of the serotonin antagonism effects of various psychotropic agents, undertaken to determine whether or not adrenergic and cholinergic mechanisms are involved in the stimulatory action of serotonin, is reported. The agents investigated include phentolamine, cocaine, atropine, propranolol, lysergic acid diethylamide (LSD), and methysergide; their action on serotonin was observed in isolated canine cerebral arteries. The dose response curve of serotonin was not influenced by 10(-7)M phentolamine but was slightly moved to the right and downward at 10(-6)M. The contractile response to serotonin was unaffected by cocaine (3x10(-6)M), atropine (10(-6)M) and propranolol (10(-6)M). The addition of LSD, ergotamine and methysergide caused a dose dependent contraction. Treatment with LSD (10(-9) and 10(-8)M), ergotamine (10(-10) to 10(-8)M) and methysergide (10(-8) to 19(-6)M) shifted the dose response curve of serotonin to the right and downward in a dose dependent manner. The inhibitory effect of methysergide was reversed by washing, while that of ergotamine was not reversed. Apparent pA₂ values of LSD, ergotamine and methysergide were 9.17, 9.63 and 7.92, respectively. Contractile responses to 20mM K⁺ were not significantly influenced by these blocking agents even in the highest concentrations used. It is concluded that an alpha-adrenergic mechanism is not involved in the genesis of serotonin induced contractions and that serotonin acts directly on serotonergic receptors in canine cerebral arteries. 35 references. (Author abstract modified)

253106 Modak, Arvind T.; Weintraub, Susan T.; McCoy, Timothy H.; Stavino, William B. 7703 Floyd Curl Drive, San Antonio, TX 78284 Use of 300-msec microwave irradiation for enzyme inactivation: a study of effects of sodium pentobarbital on acetylcholine concentration in mouse brain regions. *Journal of Pharmacology and Experimental Therapeutics*. 197(2):245-252, 1976.

A study of the effects of sodium pentobarbital on acetylcholine concentration in mouse brain regions is reported in which a microwave irradiation of 6 kw at 2450 MHz for 300 msec was sufficient to completely inactivate cholinesterase and choline acetyltransferase. After this method of sacrifice, the acetylcholine contents of mouse brain regions, given in nanomoles per gram were found to be: striatum, 81; medulla pons, 44; diencephalon midbrain, 34; hippocampus, 31; cerebral cortex, 26; and cerebellum, 17. Sodium pentobarbital caused a dose dependent increase in whole brain acetylcholine. A maximal increase of 81% in whole brain was seen at 15 minutes with 80mg/kg of sodium pentobarbital. The increase in acetylcholine after sodium pentobarbital treatment was not caused by anoxia from respiratory depression or by hypothermia. All brain regions except the cerebellum exhibited an increase in acetylcholine after pentobarbital treatment. Fifteen minutes after treatment, cerebellar acetylcholine was significantly decreased. However, at the time when half of the animals had regained the righting reflex, the unconscious mice showed an increase in cerebellar acetylcholine which was statistically significant as compared to control. The relative accumulation rate of acetylcholine calculated for cerebral cortex and hippocampus was higher than that for striatum although the absolute rate of accumulation of ACh was higher in the striatum. Thus, after sodium pentobarbital treatment, the cerebral cortex and hippocampus exhibit a greater cholinergic response than the striatum. 31 references. (Author abstract)

253107 Tseng, Liang-Fu; Menon, M. Krishna; Loh, Horace H. Department of Pharmacology, University of California Medical Center, San Francisco, CA 94143 Comparative actions of monomethoxyamphetamines on the release and uptake of biogenic amines in brain tissue. *Journal of Pharmacology and Experimental Therapeutics*. 197(2):263-271, 1976.

To investigate the reasons for the different behavioral effects caused by para-methoxyamphetamine (PMA), meta-methoxyamphetamine (MMA), ortho-methoxyamphetamine (OMA), and amphetamine (A), a comparison was made among these drugs on the release and uptake of 3H-5-hydroxytryptamine (3H-5-HT), 3H-norepinephrine (3H-NE), and 3H-dopamine (3H-DA) in tissue slices of cerebral cortex and corpus striatum of rat brain. The potencies for the increased release of 3H-5-HT were found to be PMA greater than MMA greater than or equal to A greater than OMA in cerebral cortex, of 3H-NE in cortex, A greater than or equal to PMA equal MMA greater than OMA, and of 3H-DA in corpus striatum, A greater than MMA greater than PMA greater than or equal to OMA. The potencies for inhibiting the uptake of 3H-5-HT in cerebral cortex and corpus striatum were found to be PMA greater than MMA greater than A greater than OMA and of 3H-NE in cortex A greater than PMA greater than or equal to MMA greater than OMA, and 3H-DA in corpus striatum A greater than MMA greater than PMA greater than OMA. It was found that d-PMA is equipotent to l-PMA in increasing the release of 3H-5-HT but is more potent than l-PMA in blocking the uptake of 3H-5-HT. The high potency of PMA on increasing the release and inhibiting the uptake of 5-HT suggests that 5-HT may be involved in the production of hallucinogenic effects of PMA. 38 references. (Author abstract modified)

253109 Skolnick, P.; Daly, J. W.; Freedman, R.; Hoffer B. J. National Institutes of Health, NIAMDD-LD Bldg. 4, Room 212, Bethesda, MD 20014 Interrelationship between catecholamine-stimulated formation of adenosine 3',5'-monophosphate in cerebellar slices and inhibitory effects on cerebellar Purkinje cells: antagonism by neuroleptic compounds. *Journal of Pharmacology and Experimental Therapeutics*. 197(2):280-292, 1976.

A comparison of the effect of phenothiazine and thioxanthene derivatives on the inhibition of discharge of cerebellar Purkinje cells by catecholamines and on the catecholamine stimulated formation of adenosine 3',5'-monophosphate (cyclic AMP) in cerebellar slices of F-344 rats is reported. Clinically active neuroleptics, such as fluphenazine and alpha-flupenthixol, antagonized the effects of norepinephrine in both experimental models, while clinically inactive compounds, such as promethazine and beta-flupenthixol, had little or no antagonistic activity. Fluphenazine and alpha-flupenthixol at a concentration of 100 micromoles inhibited norepinephrine elicited accumulations of cyclic AMP by only 30%, whereas the beta antagonist, sotalol (MJ 1999) blocked the norepinephrine response completely at a concentration of only 10 micromoles. Clonidine, an alpha adrenergic antagonist in cerebral cortical cyclase systems, had no effect on biochemical or electrophysiological responses to norepinephrine in the cerebellar systems. The accumulations of cyclic AMP elicited by the pure beta agonist, isoproterenol, were antagonized partially by fluphenazine and completely by sotalol, and fluphenazine blocked the inhibitory effects of isoproterenol on Purkinje cells. Dopamine had no effect on levels of cyclic AMP in cerebellar slices in concentrations up to 500 micromoles. It is proposed that the catecholamine elicited accumulation of cyclic AMP in cerebellar slices occurs in at least

two different cell populations and that the beta adrenergic receptors associated with this response are blocked by neuroleptic compounds only in a population which includes the Purkinje neurons. 55 references. (Author abstract modified)

253110 Bartolome, Jorge; Seidler, Frederic J.; Anderson, Thomas R.; Slotkin, Theodore A. Department of Physiology, Duke University Medical Center, Durham, NC 27710 **Effects of prenatal reserpine administration on development of the rat adrenal medulla and central nervous system.** *Journal of Pharmacology and Experimental Therapeutics*. 197(2):293-302, 1976.

To determine the effects of prenatal reserpine administration on the development of the adrenal medulla and the central nervous system, reserpine (1mg/kg s.c.) was administered to pregnant rats at different periods of gestation. Rats born to mothers who received reserpine on days 6, 5 and 4 or 4, 3 and 2 before delivery showed early postnatal adrenal catecholamine depletion, an effect which can be attributed to a direct action of the drug; however, at no time was induction of tyrosine hydroxylase or dopamine beta-hydroxylase observed. Administration of reserpine on days 9, 8 and 7 before delivery did not alter postnatal adrenal catecholamine levels in the offspring but produced permanent elevations in enzyme activities and vesicular amine uptake beginning at 10 days of age. Studies utilizing direct stimulation with nicotine indicated that the inherent responsiveness of the adrenal medulla itself was the same in control and reserpine exposed pups. These data all suggest that sympathoadrenal tone has been permanently increased in the offspring of rats which have been exposed to reserpine early in gestation. In the brain, administration of reserpine on days 6, 5 and 4 before delivery resulted in a delay in early postnatal development of brain weight and synaptosomal uptake mechanisms, and administration at later stages resulted in subnormal tyrosine hydroxylase activities. When reserpine was given on days 9, 8 and 7 before delivery, only the deficiency in tyrosine hydroxylase was seen. Results indicate that long-lasting changes in both peripheral and central nervous system catecholamine disposition can be produced by prenatal reserpine administration. 40 references. (Author abstract modified)

253113 Altura, Burton M.; Edgarian, H.; Altura, Bella T. Box 31, Downstate Medical Center, 450 Clarkson Avenue, Brooklyn, NY 11203 **Differential effects of ethanol and mannitol on contraction of arterial smooth muscle.** *Journal of Pharmacology and Experimental Therapeutics*. 197(2):352-361, 1976.

An investigation of the differential effects of ethanol and mannitol on contraction of arterial smooth muscle in the rat is presented. It is reported that ethanol can inhibit development of spontaneous mechanical activity, induce contractions which are not inhibited by specific amine antagonists, and potentiate or inhibit contractions induced by epinephrine and vasopressin. In addition, data indicate that ethanol can attenuate contractions induced by K(+) and can inhibit Ca(++) induced contractions of K(+) depolarized rat aortic strips. Experiments with a nonpenetrating substance, mannitol, suggest that the effects of ethanol are probably not solely a reflection of hyperosmolarity. It is suggested that ethanol may induce hyperexcitability or hypoexcitability of aortic smooth muscle by affecting movement and/or translocation of Ca(++). 33 references. (Author abstract modified)

253135 Merali, Z.; Tsang, B.; Singhal, R. L.; Hrdina, P. D. Department of Pharmacology, University of Ottawa, Ottawa,

Canada K1N 9A9 **Effect of narcotic dependence and withdrawal on striatal dopamine-sensitive adenylate cyclase and synaptosomal cyclic AMP metabolism.** *Research Communications in Chemical Pathology and Pharmacology*. 14(1):29-37, 1976.

The influence of morphine dependence and withdrawal on the metabolism of cyclic AMP and dopamine in the most prominent dopaminergically innervated area of the brain, the striatum, was examined in the rat. In rats rendered tolerant to and dependent on morphine, striatal cyclic AMP metabolism was significantly enhanced as reflected by elevated cyclic AMP levels and adenylate cyclase activity. Following withdrawal from morphine treatment, whereas the activity of striatal adenylate cyclase was significantly reduced when compared to morphine dependent rats, the drop in cyclic AMP was not significant. Although addition of dopamine (40microM) stimulated equally well the striatal adenylate cyclase from control or morphine dependent animals, the activity of dopamine stimulated enzyme was blocked in animals undergoing withdrawal. The crude synaptosomal fraction of the whole brain obtained from morphine dependent rats exhibited an even more pronounced increase in cyclic AMP which was accompanied by elevated adenylate cyclase and protein kinase activity. Naloxone administration suppressed this rise in cyclic AMP and reversed the morphine stimulated increases in adenylate cyclase and protein kinase. Following the withdrawal of morphine treatment, alterations in cyclic AMP metabolism were similar to those noted for the morphine/naloxone group. 24 references. (Author abstract modified)

253393 Placidi, G. F.; Fornaro, P.; Papeschi, R.; Cassano, G. B. Clinica Psichiatrica, University of Pisa, Italy **Autoradiographic distribution study of 14C-DOPA in cat brain.** *Archives Internationales de Pharmacodynamie et de Therapie (Ghent)*. 220(2):287-296, 1976.

The penetration and distribution in various areas of cat brain of 14C-DL-DOPA and/or its derivatives is studied by the autoradiographic technique. The highest activity was found, 1 hr after administration, in the caudate nucleus, putamen and n. accumbens, while hypothalamus, substantia nigra, substantia grisea pericentralis, tuberculum olfactorium, raphe nuclei and nucleus interpeduncularis showed lower levels of labelling. Very low activity was detected in the cerebral cortex and in the other gray and white matter structures of brain. After pretreatment with a peripheral DOPA-decarboxylase inhibitor or high dosage of cold DOPA, the distribution pattern was not modified but the levels of radioactivity were greatly enhanced. The localization of the drug in dopaminergic structures and other areas of the brain is discussed. 25 references. (Author abstract)

253406 Sarkar, C.; Ghosh, J. J. Department of Biochemistry, Calcutta University, Calcutta-700019, India **Effect of delta-9-tetrahydrocannabinol on gangliosides and sialoglycoproteins in subcellular fractions of rat brain.** *Journal of Neurochemistry (Oxford)*. 26(4):721-723, 1976.

Effects of in vivo administration of delta-9-THC on the ganglioside and sialoglycoprotein contents of rat brain subcellular fractions are studied. Results indicate that the administration of the drug under both acute and chronic conditions brings about characteristic changes in the sialoglycoproteins and ganglioside content in all the subcellular fractions. Both sialoglycoproteins and ganglioside contents were markedly increased in microsomal and synaptosomal fractions and decreased in the mitochondrial fractions although the increase in the synaptosomal fractions was found most striking. After

chronic treatment, both ganglioside and sialoglycoprotein content did not change substantially in all the fractions except for a small increase in case of synaptosomal fractions. 22 references. (Author abstract modified)

253407 Boegman, R. J.; Wood, P. L. Department of Pharmacology, Queen's University, Kingston, Ontario, Canada. **Monoamines as possible mediators in the regulation of fast axoplasmic flow.** *Journal of Neurochemistry* (Oxford). 26(4):737-740, 1976.

The effect of drugs which have been shown to alter monoamines in the CNS on the rate of fast axoplasmic flow of (3H)leucine labeled material in the rat sciatic nerve is examined. Drugs which deplete monoamines led to a decrease while those which increase the level of monoamines led to an increase in the rate of fast axoplasmic flow. Monoaminergic drugs were also found to alter the amount of (3H) leucine incorporated into spinal cord. 35 references. (Author abstract)

253411 Wraae, O.; Hillman, H.; Round, Elizabeth. Unity Laboratory, Department of Human Biology and Health, University of Surrey, Guildford, Surrey, GU2 5XH, England. **The uptake of low concentrations of lithium ions into rat cerebral cortex slices and its dependence on cations.** *Journal of Neurochemistry* (Oxford). 26(4):835-843, 1976.

Uptake of low concentrations of lithium ions (Li+) is measured in rat cerebral cortical slices. Rat cerebral slices were incubated in oxygenated Krebs-Ringer bicarbonate glucose saline, and the uptake of Li+ was measured after periods of 15s to 5 min. Saturation was not seen within the concentrations of Li+ employed (.05 to 2.0mM). The half-time of the uptake was 7.9min. Findings indicate that cerebral slices take up Li+ in the presence of low concentrations in the medium at a rate which is approximately similar to that of potassium ions (K+). They concentrate Li+ by a mechanism which is dependent upon the presence of glucose and oxygen in the medium. Li+ interacts strongly with K+ in the uptake, but the findings are not compatible with the concept that Li+ competes with K+ for a single carrier. 37 references. (Author abstract modified)

253536 Utzinger, Robert. Institute of Medical Microbiology, University of Zurich, Universitätsstrasse 2, CH-8006 Zurich, Switzerland. **Hapten-immunological studies on mescaline.** *Psychopharmacologia* (Berlin). 41(3):301-304, 1975.

Hapten immunological studies were conducted on mescaline in rabbits. Antibodies with mescaline binding specificity were raised in rabbits by immunization with conjugates of bovine serum albumin with mescaline or its analogue 3, 4, 5-trimethoxyphenylacetic acid. In immunized rats given mescaline and compared to behaviorally nonimmunized controls, the anti mescaline antibody seemed to act as a depot for the administered drug. It was concluded that vaccination against abuse of marijuana and hashish seems feasible. Antidrug antibody experimentation with strong hallucinogens such as LSD is recommended. 13 references. (Author abstract modified)

253691 Heikkila, Richard E.; Goldfinger, Sue S.; Orlansky, Herbert. Department of Neurology, Mount Sinai School of Medicine, Fifth Avenue and 100th Street, New York, NY 10029. **The effect of various phenothiazines and tricyclic antidepressants on the accumulation and release of (3H)norepinephrine and (3H)5-hydroxytryptamine in slices of rat occipital cortex.** *Research Communications in Chemical Pathology and Pharmacology*. 13(2):237-250, 1976.

The effects of various structurally related tricyclic antidepressants and phenothiazines on the accumulation of (3H)5-hydroxytryptamine, ((3H)5-HT) and (3H)norepinephrine ((3H)NE) and on the release of previously accumulated (3H)5-HT and (3H)NE were in slices of rat occipital cortex. Results revealed that: 1) each compound was a better inhibitor of accumulation (both of (3H)5-HT and (3H)NE) than it was a releasing agent; 2) the hydroxylation of tricyclic antidepressants made little difference in the potencies of the compounds as inhibitors of both (3H)NE and (3H)5-HT accumulation; 3) the N-dimethylated phenothiazines and tricyclics (tertiary amines) were better inhibitors of (3H)5-HT accumulation than their corresponding secondary amines; 4) the change from a dimethylene bridge in the tricyclic antidepressants to an S atom in the phenothiazines led to a considerable decrease in the potency of the compounds as inhibitors of (3H)5-HT accumulation, but made less difference in the (3H)NE accumulation system. 15 references. (Author abstract)

253693 Chang, Kun; Chiou, Win L. Dept. of Pharmacy, Clinical Pharmacokinetics Laboratory, College of Pharmacy, Univ. of Illinois at the Medical Center, Chicago, IL 60612. **Interactions between drugs and saliva-stimulating parafilm and their implications in measurements of saliva drug levels.** *Research Communications in Chemical Pathology and Pharmacology*. 13(2):357-360, 1976.

An investigation was conducted to reveal the order of magnitude of interaction between drugs and saliva stimulation Parafilm which may accompany the assay of drugs in saliva samples. The interaction between Parafilm and four tranquilizers in their neutral phosphate buffer solutions resulted in various degrees of loss of the drugs from the solutions. The values of loss ranged from 15 to 34% for chlorpromazine and 8 to 42% for butaperazine at the initial concentration range of 2 to 20micro/ml at room temperature. Under the same conditions, the values of loss from saliva for these drugs were fairly constant; about 25% and 17%, respectively. 7 references. (Author abstract modified)

253695 Tunncliffe, G.; Butterworth, R. F.; Tsukada, Y.; Barbeau, A. Laboratory of Neurochemistry, Clinical Research Institute of Montreal, 110 Pine Avenue West, Montreal, Quebec H2W 1R7 Canada. **Normal glutamic decarboxylase activity in rat striatum and retain following administration of L-Dopa.** *Canadian Journal of Physiology and Pharmacology* (Ottawa). 54(2):79-82, 1976.

An investigation was undertaken in an attempt to clarify the action of L-Dopa on glutamic acid decarboxylase (GAD) activity in the nervous system of the rat. Data are presented which indicate that neither chronic (1g/kg) nor acute (100mg/kg) administration of L-Dopa has any effect on striatal or retinal GAD activity measured in the absence of added cofactor. Results are discussed in the light of a report relating L-Dopa therapy to modification of GAD activity in Parkinson's disease. 17 references. (Author abstract modified)

253700 Collu, Robert; Letarte, Jacques; Leboucq, Gilles; Ducharme, Jacques R. Division of Endocrinology and Metabolism, Hopital Sainte-Justine and Université de Montreal, Montreal, Quebec H3T 1C5, Canada. **Endocrine effects of chronic administration of psychoactive drugs to prepubertal male rats. II. LSD.** *Canadian Journal of Physiology and Pharmacology* (Ottawa). 53(6):1023-1026, 1975.

The endocrine effects of chronic D-lysergic acid diethylamide (LSD) administration to prepubertal animals were studied by injecting intraperitoneally three times a week for a month

either 100 or 500 micrograms of the psychoactive drug per kilogram or the vehicle to groups of Sprague-Dawley male rats starting at 21 days of age. Animals injected with either dosage of LSD had smaller bodyweights than controls and tail length was significantly reduced in the high dosage group, plasma levels of growth hormone (GH) were decreased in the high dosage group, and pituitary levels in the low dosage group. Plasma levels and pituitary concentrations of luteinizing hormone and follicle stimulating hormone were not significantly modified by the drug. The low dosage of LSD decreased the brain levels of noradrenaline and increased those of dopamine, while the high dosage decreased those of 5-hydroxyindoleacetic acid. It is thought that LSD, when administered chronically to developing animals, can inhibit body growth probably by altering the secretion of GH through modifications of its neuroendocrine control. 14 references. (Author abstract)

04 MECHANISM OF ACTION: BEHAVIORAL

242745 Kolasiewicz, W.; Wolfarth, S. Institute of Pharmacology, Polish Academy of Sciences, 31-344 Krakow, 52 Ojcowska Str., Poland. **An objective and sensitive method for quantitative measurement of stereotyped gnawing.** *Pharmacology, Biochemistry and Behavior.* 4(2):201-202, 1976.

A simple device for quantitative measurement of apomorphine or amphetamine induced gnawing is described. This device enables the investigator to maintain close and objective control over the intensity of stereotyped gnawing, thus giving the possibility to differentiate discrete quantitative changes. 5 references. (Author abstract)

242746 Schmalbach, Nancy L.; Kutscher, Charles L. Dept. of Psychology, Syracuse University, Syracuse, NY 13210. **Pitressin-induced inhibition of drinking following water deprivation in the SWR/J mouse.** *Pharmacology, Biochemistry and Behavior.* 4(2):203-205, 1976.

The effect of Pitressin on drinking was studied in the SWR/J mouse strain. This strain develops an age dependent nephrogenic diabetes insipidus in which the kidneys become refractory to Pitressin, facilitating the experimental separation of renal from extrarenal Pitressin effects. The mice, 8 hr water deprived, were injected intraperitoneally with 0, 10, 50, 200, and 800 mU of aqueous Pitressin, 5 min prior to presentation of water. Drinking measurements made at 5, 15, 25, and 35 min of the drinking period revealed a significant transient inhibition of drinking for the three highest dosages. Injections had no measurable effect on blood pressure. Only the highest dosage had an effect on gross motor activity, a significant decline. 20 references. (Author abstract modified)

242747 Wilson, Marvin C.; Schuster, Charles R. Dept. of Pharmacology, School of Pharmacy, University of Mississippi, Oxford, MI 38677. **Mazindol self-administration in the rhesus monkey.** *Pharmacology, Biochemistry and Behavior.* 4(2):207-210, 1976.

The ability of the intravenous administration of mazindol (SaH-42-548) to act as a reinforcer in monkeys previously conditioned to self-administer cocaine was ascertained. Unit dosages of 50 and 100 micrograms/kg resulted in self-administration rates significantly greater than that which occurred with saline. An inverse relationship existed between unit dosage and frequency of self-administration over the unit dosage range 50-200 microgram/kg. The total mazindol dosage self-administration per session was independent of unit dosage. Approximately 2-3 mg/kg was self-administered by each animal

during a 4 hr session at each of the three unit dosages. This tends to indicate that the 200 microgram/kg unit dosage was also reinforcing even though the self-administration rate was similar to that of saline. It is concluded that mazindol can serve as a reinforcer and that the relationship between total session intake, unit dosage, and self-administration frequency of mazindol are similar to those seen with other reinforcing psychomotor stimulant drugs. 6 references. (Author abstract)

242748 Mora, F.; Rolls, E. T.; Burton, M. J.; Shaw, S. G. University of Oxford, Dept. of Experimental Psychology, South Parks Road, Oxford OX1 3UD, England. **Effects of dopamine-receptor blockade on self-stimulation in the monkey.** *Pharmacology, Biochemistry and Behavior.* 4(2):211-216, 1976.

The involvement of dopamine receptors in self-stimulation in the monkey is examined. In a dose response experiment it is shown that intraperitoneal injections of the dopamine receptor blocking agent and neuroleptic spiroperidol severely attenuate self-stimulation in the orbitofrontal cortex, hypothalamus, and in the region of the locus coeruleus, in the rhesus monkey and in the squirrel monkey. In the rhesus monkey intracranial injections of spiroperidol bilaterally into the nucleus accumbens or the hypothalamus attenuated self-stimulation of the amygdala, and injections into the orbitofrontal cortex attenuated self-stimulation of the amygdala and lateral hypothalamus. Self-stimulation at other sites tested was much less affected by the injections, and injections into the region of the locus coeruleus were ineffective. These results together with other control experiments suggest that spiroperidol can attenuate self-stimulation in the monkey independently of any motor impairment or sedation produced, and that dopamine receptors in particular brain regions are involved in self-stimulation of particular brain sites. 16 references. (Author abstract modified)

242749 McCarty, Richard C.; Whitesides, George H.; Tomosky, Thomas K. Dept. of Pathobiology, Johns Hopkins University, School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore, MD 21205. **Effects of p-chlorophenylalanine on the predatory behavior of *Onychomys torridus*.** *Pharmacology, Biochemistry and Behavior.* 4(2):217-220, 1976.

Adult male and female grasshopper mice, *Onychomys torridus* were treated over a 5 day period with p-chlorophenylalanine, a depletor of brain 5-hydroxytryptamine (5-HT), in a study of predatory aggression. These mice exhibited a significant decrease over the 5 day test interval in predation time and predation score in encounters with cricket prey. The basic pattern and frequency of attacks for drug treated mice remained similar to saline controls. The relation between the various brain amine systems and predatory behavior is discussed and the utility of the grasshopper mouse as a laboratory model for the study of predatory behavior is emphasized. 28 references. (Author abstract modified)

242750 Cameron, O. G.; Appel, J. B. Dept. of Psychiatry, University of Michigan Hospitals, Ann Arbor, MI 48104. **Drug-induced conditioned suppression: specificity due to drug employed as UCS.** *Pharmacology, Biochemistry and Behavior.* 4(2):221-224, 1976.

The classical conditioning potential of several drugs was tested in rats by pairing a light conditioned stimulus (CS) with the drug unconditioned stimuli. These stimuli were superimposed on a variable interval 30 sec schedule for water reinforcement. Conditioning (suppression of bar-pressing in the presence of the CS) was definitely demonstrated with psilocybin, was suggested but not clearly shown with LSD, and was not evident with methyl atropine nitrate or pentobarbital.

These results indicate that previously demonstrated drug induced conditioned suppression is not a nonspecific effect of unconditioned suppression but depends on the type of drug employed. 14 references. (Author abstract)

242882 Nathan, B. A.; Vogel, J. R. Central Nervous System Section, William H. Rorer, Inc., Fort Washington, PA 19034 **Taste aversions induced by d-amphetamine: dose-response relationship.** *Bulletin of the Psychonomic Society.* 6(3):287-288, 1975.

Dose related taste aversions induced by d-amphetamine were explored in the rat. Learned taste aversions, as measured by increased time to complete 100 licks of a milk solution 3 days after training, were induced in rats by a single pairing of sweetened condensed milk solution with doses of 1.0 to 4.0 mg/kg d-amphetamine sulfate. This result supports previous findings of aversions induced by 2.0 mg/kg d-amphetamine in several other paradigms and suggests that a dose of 1.0 mg/kg also induces reliable aversions. 12 references. (Author abstract)

242892 Figler, Michael H. Dept. of Psychology, Towson State College, Baltimore, MD 21204 **Twenty-four-hour retention of chlordiazepoxide (Librium) -attenuated threat behavior in male Siamese fighting fish (*Betta splendens*).** *Bulletin of the Psychonomic Society.* 6(3):317-320, 1975.

The effects of chlordiazepoxide (Librium) on threat behavior in male Siamese fighting fish (*Betta splendens*) were investigated in two studies. The first experiment examined the 24 hour retention of chlordiazepoxide induced attenuation and facilitation of habituation of species specific threat behavior in male Siamese fighting fish. In session 1, subjects, in a drug solution or plain water were exposed to an undrugged conspecific stimulus fish for 40 minutes. After 24 hours back in their home jars, all fish were retested in plain water with the same stimulus fish. Chlordiazepoxide showed similar threat behavior attenuation in sessions 1 and 2 as compared to the control situation. In the second study, subjects were immersed in one of the two treatments for the same time period with no stimulus fish present. After 24 hours in their home environment, all fish were tested in plain water with a stimulus fish present. Chlordiazepoxide attenuated threat behavior and facilitated its habituation 24 hours after initial exposure to the drug. Therefore, the results of the first study are felt to be related to sustained drug activity rather than transfer of drug induced behavior from a drugged to a nondrugged state. Suggestions for further research, based upon this sustained drug activity, are discussed. 12 references. (Author abstract)

242894 Houser, Vincent P. Psychotropic Drug Lab., VA Hospital, Perry Point, MD 21902 **The effects of meprobamate upon the aversive threshold of rats.** *Bulletin of the Psychonomic Society.* 6(3):325-326, 1975.

An attempt was made to assay the analgesic potency of orally administered meprobamate (50 or 100 mg) in the rat, using the spatial preference technique. This drug was able to raise the aversive threshold when administered in a dose of 100 mg. This same dose, however, also significantly reduced the number of motor responses made during threshold testing. These results are interpreted to suggest that meprobamate produces its effects on the aversive threshold indirectly by inhibiting the execution of the escape response. 7 references. (Author abstract)

243013 Eich, James Eric; Weingartner, Herbert; Stillman, Richard C.; Gillin, J. Christian. Dept. of Psychology, University

of Maryland, Baltimore County, 5401 Wilkens Ave., Baltimore, MD 21228 **State-dependent accessibility of retrieval cues in the retention of a categorized list.** *Journal of Verbal Learning and Verbal Behavior.* 14(4):408-417, 1975.

A state-dependent learning paradigm was used in which Ss encoded and recalled equivalent lists of conceptually categorized words in several conditions: 1) encode following administration of a marijuana placebo/recall placebo; 2) encode placebo/recall following administration of active marijuana; 3) encode marijuana/recall marijuana; and 4) encode marijuana/recall placebo. Free recall of both words and categories was more complete in the encode marijuana/recall marijuana condition than in the encode marijuana/recall placebo condition, a finding indicative of asymmetric state-dependent learning. Differences were not, however, apparent when recall was prompted with appropriate extralist retrieval cues. It is concluded that the accessibility of retrieval cues which provide access to higher order memory units which have been encoded in the dissociated state depends on restoration of that state at the time of attempted recall. Implications of these findings are considered. 22 references. (Author abstract)

243181 Luthra, Yugal K.; Rosenkrantz, Harris; Braude, Monique C. Mason Research Institute, Worcester, MA 01608 **Cerebral and cerebellar neurochemical changes and behavioral manifestations in rats chronically exposed to marijuana smoke.** *Toxicology and Applied Pharmacology.* 35(3):455-465, 1976.

Cerebral and cerebellar neurochemical changes and behavioral manifestations of rats exposed to marijuana cigarette smoke are reported. Control animals inhaled smoke produced by placebo cigarettes. In the first week of exposure, 20% of lower dosed rats were hyperactive, and 50% at the high dose were prostrate or ataxic upon removal from the inhalator. Behavioral aberrations ameliorated within a few hours except for the depression exhibited by males at the high dose. Tolerance to central nervous system (CNS) inhibition developed in 1-2 weeks. CNS stimulation, as manifested by hypersensitivity and hyperactivity, progressively involved more animals, primarily females; tolerance to CNS stimulation developed thereafter. Fighting was displayed by 90% of females and 50% of males at 4 mg/kg by weeks 6-7. Neurotoxicity was expressed by involuntary vertical jumping, predominantly among high dosed males in weeks 3 and 8. The extent of change in enzyme activity was generally reduced with continued treatment. Cerebellar ribonucleic acid (RNA) increased approximately 20% in rats of both sexes, but at different time intervals during the subchronic phase, and remained elevated in females at 87 days. Neurochemical changes were sex related and coincided with behavioral manifestations, and some changes extended into the recovery period. Inhalation findings were similar to those obtained earlier by the oral route; however, females demonstrated a greater facility to adapt to the cumulative toxic effects of marijuana smoke. (Author abstract modified)

243234 Kaiser, Jan; Trabka, Jan; Burow, Jerzy. Krakow, Poland **The role of the amygdaloid nuclei in the regulation of adaptive behavior.** *Rola jąder migdałowatych w regulacji zachowania przystosowawczego.* *Prace Psychologiczne-Pedagogiczne (Krakow).* No. 23:71-87, 1975.

Regulation of adaptive behavior was investigated in cats neuropharmacologically. Following a 48 hour fast, cats were exposed to a food stimulus. The stimuli of either a piece of meat or a live mouse were found to release forms of preparatory/alimentary behavior of great intensity. Intraperitoneal and

intrastructural administration of either benactazine or perphenazine inhibited the preparatory alimentary reactions. This effect was always accompanied by selective synchronization of the electroencephalogram from the amygdaloid nuclei complex. The amygdaloid nucleus was tentatively concluded to be one of the most important structures in which the reflection of unfulfilled needs and the induction of a condition of specific sensitivity to external stimuli take place. Periodic disconnection of the amygdaloid nuclei complex from the integrated activity of the brain caused the inhibition of the preparatory activity. 6 references. (Journal abstract modified)

243346 Barr, Gordon A.; Moyer, K. E.; Gibbons, Judith L. Dept. of Psychiatry, Room G54, Albert Einstein College of Medicine, Bronx, NY 10461 Effects of imipramine, d-amphetamine, and triptelennamine on mouse and frog killing by the rat. *Physiology & Behavior*. 16(3):267-269, 1976.

The effects of imipramine, d-amphetamine, and triptelennamine on frog killing and mousekilling by rats were examined. Results indicate that d-amphetamine significantly increased the latencies of attacking and killing both prey. Triptelennamine and imipramine blocked the response to a frog. While most rats preferred to attack and kill frogs rather than mice as determined by a paired comparison test, the drug effects were unrelated to those preferences. All three compounds significantly increased sniffing latencies to a frog but not to a mouse. The results suggest that drugs which block mousekilling may also block frog killing. 8 references. (Author abstract modified)

243348 Ljungberg, T.; Ungerstedt, U. Dept. of Histology, Karolinska Institutet, S-104 01, Stockholm, Sweden Reinstatement of eating by dopamine agonists in aphagic dopamine denervated rats. *Physiology & Behavior*. 16(3):277-283, 1976.

To test the hypothesis that the syndrome of adipsia and aphagia seen after bilateral intracerebral injections of 6-hydroxydopamine is mainly caused by a degeneration of dopamine neurons, an attempt was made to reinstate eating by substituting the lost dopamine transmission with dopamine agonistic drugs. Rats that were made adipsic and aphagic by 6-hydroxydopamine injections into the ventral mesencephalon in the region of the ascending dopamine axons were tested on apomorphine, L-dopa or ET495 (1-(2-pyrimidyl)-4-piperonyl piperazine). It was possible to reinstate coordinated eating with low doses of these drugs 24-48 hours after the lesion. Higher doses did not reinstate eating as well but gave an increase in the total activity with stereotyped behavior and non-food directed gnawing. Animals that were made adipsic and aphagic by lateral hypothalamic electrocoagulations did not eat in response to the dopamine agonistic drugs. Findings support the hypothesis that 6-hydroxydopamine induced adipsia and aphagia is due to an interruption of dopamine transmission. 44 references. (Author abstract modified)

243758 Ashford, J.; Jones, B. J. Pharmacy Department, St. Luke's Hospital, Guildford, Surrey, England The effects of intra-amygdaloid injections of 6-hydroxydopamine on avoidance responding in rats. *British Journal of Pharmacology* (London). 56(3):255-261, 1976.

The effects of bilateral intraamygdaloid injections of 6-hydroxydopamine (6-OHDA) on shuttlebox avoidance acquisition, retention, and extinction, and passive-avoidance acquisition were examined in rats. Intraamygdaloid 6-OHDA injections produced catecholamine depletion in and around the amygdalae but failed to reduce striatal dopamine concentrations. Conditioned avoidance acquisition was markedly in-

hibited in 6-OHDA treated rats, whereas retention and extinction were only slightly impaired. Passive-avoidance acquisition was slightly but significantly improved in rats with amygdaloid 6-OHDA lesions. Treated rats showed no motor abnormalities; they were not hypoactive in a photocell activity cage; and they performed as well as controls on a rotating rod. It is suggested that the conditioned avoidance acquisition deficit in rats with amygdaloid 6-OHDA lesions may be related to an impairment of associative learning rather than to perceptual or motor disturbances. 17 references. (Author abstract modified)

243788 Guerriero, Frederick J.; Fox, Kevin A. Department of Biology, SUNY College at Fredonia, Fredonia, NY 14063 Benzodiazepines and reproduction of Swiss-Webster mice. *Research Communications in Chemical Pathology and Pharmacology*. 13(4):601-610, 1976.

In a study of the relationship between benzodiazepines and reproduction of Swiss-Webster mice, the effects of chronic dietary administration of six different benzodiazepine tranquilizers (chlordiazepoxide, diazepam, oxazepam, prazepam, flurazepam, and nitrazepam) to breeding pairs of mice were studied. Drug administration resulted in alterations of the normal patterns of reproductive behavior and fetal growth. Significant decreases in mating performance were seen among mice given diets containing 0.15% chlordiazepoxide, 0.05% diazepam, 0.05 and 0.15% oxazepam, 0.02 and 0.10% prazepam, 0.10% flurazepam, and 0.025% nitrazepam. Offspring in all drug treatments showed significantly depressed bodyweights at birth. 17 references. (Author abstract)

243803 Milson, J. A.; Pycoc, C. J. Department of Pharmacology, University of Bristol Medical School, Bristol BS8 1TD, England Effects of drugs acting on cerebral 5-hydroxytryptamine mechanisms on dopamine-dependent turning behaviour in mice. *British Journal of Pharmacology* (London). 56(1):77-85, 1976.

The effects of drugs acting on cerebral 5-hydroxytryptaminergic mechanisms on drug induced turning behavior in mice with unilateral destruction of nigrostriatal dopaminergic nerve terminal were studied. Administration of L-tryptophan or 5-hydroxytryptophan increased brain 5-hydroxytryptamine and decreased the turning induced by both apomorphine and amphetamine. Parachlorophenylalanine decreased brain 5-hydroxytryptamine and increased both apomorphine and amphetamine induced circling behavior. Varying the protein content of dietary intake significantly altered brain 5-hydroxytryptamine and tryptophan levels, spontaneous locomotor activity and amphetamine induced circling behavior in these mice. Systemic administration of methysergide lysergic acid diethylamide cyproheptadine or clomipramine produced no consistent effect on drug induced turning behavior. The results suggest that circling behavior due to striatal dopamine receptor stimulation is depressed by an elevation of brain 5-hydroxytryptamine and enhanced by a reduction in brain 5-hydroxytryptamine. The possible physiological relationship between dopamine and 5-hydroxytryptamine neurons in the basal ganglia is discussed. 57 references. (Author abstract modified)

243804 Johnson, F. N. Department of Psychology, University of Lancaster, Fylde College, Bailrigg, Lancaster, England The effect of lithium chloride on one-trial passive avoidance learning in rats. *British Journal of Pharmacology* (London). 56(1):87-91, 1976.

Expression of a one trial passive-avoidance learning response in rats was examined following injections of lithium chloride or sodium chloride before and after initial training and

before the first day of testing. Five tests were given at daily intervals, 24 h after training being the time of the first test. Lithium given before the first day of testing impaired response expression on the first and all subsequent days of testing; the rate of extinction was unaffected. Given both before and immediately after initial training, lithium impaired response expression on the first day of testing but slowed down the subsequent rate of extinction, leading eventually to improved performance on the fifth day, as compared with placebo treated control subjects. The results are interpreted in the light of the hypothesis that lithium impaired the central processing of sensory information. 18 references. (Author abstract)

243878 Briesch, Stuart T.; Zemlan, Frank P.; Hoebel, Bartley G. Department of Psychology, Princeton University, Princeton, NJ 08540 **Hyperphagia and obesity following serotonin depletion by intraventricular p-chlorophenylalanine.** *Science*. 192(4237):382-385, 1976.

The effect of intraventricular injection of p-chlorophenylalanine (PCPA) on hunger and on the diurnal pattern of food intake was investigated in normal and ovariectomized rats. PCPA is a drug which depletes serotonin by inhibiting tryptophan hydroxylase activity. In addition to measurements of weight and food intake, PCPA injected rats were sacrificed and their level of brain biogenic amines determined. It was found that loss of brain serotonin was associated with overeating and increased body weight. Rats injected with PCPA began overeating after 3 days and continued to display marked hyperphagia, primarily in the daytime, accompanied by increased bodyweight for 1 to 2 weeks. The effect was related to drug dose and to the degree and duration of serotonin depletion. Norepinephrine and dopamine levels were not significantly affected. It is concluded that p-chlorophenylalanine inhibits feeding, as it does a number of other behaviors, by depleting serotonin. It is proposed that hypothalamic lesions or dietary deficiencies which selectively and sufficiently deplete serotonin will lead to overeating. 16 references. (Author abstract modified)

243879 Saller, Charles F.; Stricker, Edward M. Psychobiology Program, Department of Biology, University of Pittsburgh, Pittsburgh, PA 15260 **Hyperphagia and increased growth in rats after intraventricular injection of 5,7-dihydroxytryptamine.** *Science*. 192(4237):385-387, 1976.

Hyperphagia and bodyweight gain in rats due to the depletion of brain 5-hydroxytryptamine (5-HT) in the absence of norepinephrine (NE) depletions are demonstrated. Juvenile male Sprague-Dawley rats were injected intraventricularly with 5,7-dihydroxytryptamine (5,7-DHT). Because 5,7-DHT is known to damage both 5-HT and NE containing neurons when injected intraventricularly, the drug's action was restricted to serotonergic neurons by administering all but four of the intraventricular injections 30 to 40 mins after an intraperitoneal injection of desmethylimipramine (DMI). Following this sequence of injections, rats maintained bodyweight gains of 5 to 6 grams per day into adulthood and grew much larger than control rats. Biochemical analyses of brain tissue obtained 50 to 140 days after the injections revealed 60% to 86% depletions of telencephalic 5-HT, with catecholamine levels unchanged. Hyperphagia did not develop despite comparable losses of 5-HT when the pretreatment was withheld, implicating substantial concurrent depletions of NE. 24 references. (Author abstract modified)

244202 Lewis, Michael J.; Costa, Jonathan L.; Jacobowitz, David M.; Margules, D. L. Department of Psychology, Tufts

University, Medford, MA 02155 **Tolerance, physical dependence and opioid-seeking behavior: dependence on diencephalic norepinephrine.** *Brain Research (Amsterdam)*. 107(1):156-165, 1976.

The possible participation of a specific portion of the brain norepinephrine (NE) system in the development of tolerance, physical dependence, and opioid seeking behavior was investigated in Holtzman rats. Bilateral destruction of the ventral noradrenergic bundle by direct injections of 6-hydroxydopamine selectively depleted NE from the hypothalamus and thalamus of rats chronically addicted to morphine. After this treatment, the rats showed a reduction in tolerance to morphine, reduced symptoms of abstinence, reduced symptoms of precipitated withdrawal, and reduced voluntary consumption of an opioid. All four behavioral changes can be explained by the theory that chronic administration of narcotics induces a progressive activation of a noradrenergic system for aversion. 18 references. (Author abstract)

244214 Goodall, Edwin B.; Lorens, Stanley A. Department of Pharmacology, University of Bergen, Bergen, Norway **Effects of amphetamine, food deprivation and current intensity on self-stimulation in the rat.** *Brain Research (Amsterdam)*. 107(1):206, 1976.

In a paper presented before the Seventh Annual Meeting of the European Brain and Behavior Society held in Munich, September 8-10, 1975, intracranial self-stimulation (SS) in rats with chronically implanted lateral hypothalamic (LH), substantia nigra (SN), or medial frontal cortex (MF) bipolar electrodes were discussed. The effects of D-amphetamine and L-amphetamine hydrochloride (0.1, 0.5, 1.0 and 2.0 mg/kg) on SS rate at the three electrode sites were compared. The amphetamines were injected at 72 hour intervals with each rat receiving each dose of each isomer once. Both D-amphetamine and L-amphetamine significantly facilitated LH and SN SS rate at doses greater than 0.1 mg/kg. For each rat in the LH group, D-amphetamine had a greater peak facilitatory effect on SS rate. At the SN electrode site, the two amphetamine isomers had similar facilitatory effects. Neither isomer significantly affected MF SS rate. Only LH SS rates increased significantly in response to 72 hour food deprivation. It was proposed that SS is not mediated by a unitary anatomical and/or neurochemical system. (Journal abstract modified)

244215 Cools, A. R.; Gielen, L.; Mortiaux, H.; Janssen, H. J. Department of Pharmacology, University of Nijmegen, Nijmegen, The Netherlands **Intracaudate neurotransmitter processes in relation to raphe neurotransmitter processes: a behavioural analysis of intracerebrally applied drugs in acute and long-term morphine-treated cats.** *Brain Research (Amsterdam)*. 107(1):206-207, 1976.

In a paper presented before the Seventh Annual Meeting of the European Brain and Behavior Society held in Munich, September 8-10, 1975, the role of the caudate nucleus and linear raphe nucleus (NRL area) in morphine treated cats was elucidated through observations of behavioral changes produced by intracerebral injections of drugs into the dopamine sensitive caput nuclei caudati rostromedialis (CRM area), the serotonin sensitive caput nuclei caudati anteroventralis (CAV area), and the noradrenaline/acetylcholine sensitive NRL area. Based on the experimental observations, it was hypothesized that the transneuronal relationship between the dopamine sensitive CRM area, the serotonin sensitive CAV area and the noradrenaline/acetylcholine sensitive NRL area would be essential for the initiation and maintenance of the morphine induced behavior, whereas only the noradrenaline

sensitive structures within the NRL area would be essential for the development of tolerance to the morphine induced responses in cats. 3 references. (Journal abstract modified)

244216 Galey, Daniel; Simon, Herve; Le Moal, Michel. Laboratoire de Psychophysiologie, Institut de Biologie Animale, Avenue des Facultes, 33 405 Talence, France **Behavioural and anatomical effects of 6-OHDA injections in the ventral mesencephalic tegmentum in the rat.** Brain Research (Amsterdam). 107(1):207-208, 1976.

In a paper presented before the Seventh Annual Meeting of the European Brain and Behavior Society held in Munich, September 8-10, 1975, the involvement of catecholaminergic (CA) systems within the ventral mesencephalic tegmentum (VMT) of rats determined through injections of 6-hydroxydopamine (6-OHDA) was reported. Bilateral VMT injections of 6-OHDA produced hyperactivity and impairment of passive-avoidance learning. There were no disturbances of feeding behavior. Hyperactivity was also recorded after VMT injections of 6-OHDA limited to the area surrounding the interpeduncular nucleus. Behavior was normal in all respects, and there was no increase in locomotor activity after injection of 6-OHDA in the ventral noradrenergic bundle at pons level. Anatomical studies demonstrated the selectivity of 6-OHDA action, and terminal degenerations in the forebrain (nucleus caudatus, nucleus accumbens, tuberculum olfactorium, stria terminalis, frontal and cingulate cortex. These projections correspond to those of the A10 system demonstrated by fluorescence histochemical techniques. (Journal abstract modified)

244217 Guillemon, Antonio; Gray, Jeffrey A. Department of Experimental Psychology, University of Oxford, South Parks Road, Oxford, England **Sodium amobarbitone and the patterning effect.** Brain Research (Amsterdam). 107(1):208, 1976.

In a paper presented before the Seventh Annual Meeting of the European Brain and Behavior Society held in Munich, September 8-10, 1975, the action of sodium amobarbitone on response patterning, the tendency of animals on a single alternating reward/nonreward schedule to run faster after nonreinforced trials than after reinforced trials, was reported in rats. The effect of sodium amobarbitone was investigated in rats which had displayed stable patterning behavior throughout a long training period. It was found that the drug increased running speed on nonrewarded trials, but did not affect running speed on rewarded trials. This finding was discussed in relation to frustration theory. 1 reference. (Journal abstract)

244311 Stern, Jeffrey J.; Cudillo, Cynthia A.; Kruper, Jack. Department of Psychology, University of Michigan, Deaborn, MI 48128 **Ventromedial hypothalamus and short-term feeding suppression by caerulein in male rats.** Journal of Comparative and Physiological Psychology. 90(5):484-490, 1976.

The neural loci responsible for caerulein's suppression of eating in male rats were studied. Caerulein is a decapeptide chemically and physiologically similar to cholecystokinin, a naturally occurring gut hormone in rats. Rats with lesions in the ventromedial hypothalamus (VMH) showed reduced sensitivity to caerulein (1 microgram/kg); rats with lateral hypothalamic (LH) destruction showed heightened sensitivity. Microinjections of caerulein into the VMH, but not into the LH, limited feeding. Finally, tritiated caerulein was selectively bound to tissue in the VMH. The results are discussed in terms of the hypothesis that the VMH manages postprandial inhibition in the rat. 26 references. (Author abstract)

244343 Baum, M. J.; Vreeburg, J. T. M. Department of Endocrinology, Growth and Reproduction, Erasmus University, Rotterdam, The Netherlands **Differential effects of the anti-estrogen MER-25 and of three 5alpha-reduced androgens on mounting and lordosis behavior in the rat.** Hormones and Behavior. 7(1):87-104, 1976.

Four experiments were performed to evaluate the hypothesis that androgen must be aromatized to estrogen for the activation of masculine sexual behavior in the male rat. In Experiment One it was found that the antiestrogen MER-25 failed to disrupt mounting behavior in castrated males which simultaneously received testosterone propionate (TP). However, in Experiment Two it was found that MER-25 as well as 3beta-androstenediol effectively activated masculine behavior in castrated males treated simultaneously with dihydrotestosterone propionate. In Experiment Three and Four, performed with ovariectomized females, it was found that whereas MER-25 antagonized the stimulatory effect of estradiol benzoate (EB) on lordosis behavior, 3beta-androstenediol did not. In addition, 5alpha-dihydrotestosterone and 3alpha-androstenediol both inhibited the stimulatory effect of EB on lordosis. It is concluded that the fact that antiestrogens suppress lordosis induced in females with either EB or TP, but fail to disrupt TP induced mounting behavior in male rats does not argue against the aromatization hypothesis for masculine sexual behavior. 46 references. (Author abstract modified)

244352 Barkov, N. K. Laboratoriya farmakologii nervnoy sistemy, Instituta Farmakologii AMN SSSR, Moscow, U.S.S.R. **/Characteristic changes in conditioned defensive reflexes caused by trifluoperazine, carbamazepine and chlorpromazine./** O kharaktere vliyaniya triflazina, karbidina i aminazina na oboronitel'nye uslovnye refleksy. Zhurnal Nevropatologii i Psikiatrii imeni S. S. Korsakova (Moskva). 76(2):280-282, 1976.

The influence of trifluoperazine, carbamazepine, and chlorpromazine on the conditioned reflexes of rats to stimulation of the mesencephalic reticular formation (MRF) was investigated. Data confirm the inhibition by chlorpromazine of the mesencephalic reticular formation. Trifluoperazine and carbamazepine, unlike chlorpromazine, prevented the inhibition of defensive conditioned reflexes following stimulation of the MRF. 10 references. (Journal abstract modified)

244449 Snisarenko, A. A. Pavlov's Institute of Physiology, Academy of Science of the U.S.S.R., Leningrad, U.S.S.R. **/Change of the heartrate and sleep-wakefulness cycle after isoproterenol administration in white rats./** Izmeneniya ritma serdtsa i tsikla "bodrstvovaniye-son" v belykh kryss posle vvedeniya izoproterenola. Fiziologicheskii Zhurnal SSSR imeni I.M. Sechenova (Leningrad). 62(2):236-245, 1976.

The effect of isoproterenol administration on the heartrate and sleep/wakefulness cycle in white rats was studied. It was found that heartrate did not significantly change, however, both the duration of response/response intervals and their dispersion sharply increased. The observed shifts were least obvious during slow-wave sleep. The bradycardia periods during paradoxical sleep in rats are felt to be a beneficiary background for further suppression of the sinus automatism up to sinoauricular blockade. The data obtained suggest that heartrate during wakefulness can provide evidence of its oscillations in other phases of the cycle. The revealed changes of the sleep structure involved increasing part of the paradoxical stages in the total time of sleep in animals when measuring it starting from the fifth day after the sympathomimetic administration. (Journal abstract modified)

244455 Allikmets, L. Kh.; Zharkovskiy, A. M. Kafedra farmakologii, Tartuskogo Universiteta, Tartu, U.S.S.R. /Effects of L-dopa on emotional reactions and metabolism of serotonin in the rat brain./ Vliyanie L-DOPA na emotsional'nyye reaktsii i obmen serotoninina v mozge krysa. Byulleten' Eksperimental'noy Biologii i Meditsiny (Moskva). 81(2):134-137, 1976.

The influence of L-dopa on emotional behavior and serotonin metabolism in the brains of male Wistar rats was examined. Intraperitoneal injections of L-dopa increased the brain concentration of dopamine and homovanillic acid and lowered the level of brain serotonin, with simultaneous elevation of its metabolite 5-hydroxyindoleacetic acid. A decrease in serotonin level was accompanied by increased emotional reactivity and aggressiveness. L-dopa decreased the binding of serotonin formed from tryptophan, accelerating its catabolism in the brain; at the same time, L-dopa eliminated the depressive action of tryptophan on emotional reactivity and aggressiveness. It is suggested that the increased emotional excitation elicited by L-dopa was partially mediated through a blockade of the serotonergic system. 18 references. (Journal abstract)

244456 Klygul', T. A.; Kadletsova, O.; Vikhlyayev, Yu. I. Institut farmakologii AMN SSSR, Moscow, U.S.S.R. /The effect of prolonged administration of nitrazepam on sleep cycles in rats./ Vliyanie dlitel'nogo vvedeniya nitrazepama na tsikly sna u krysa. Byulleten' Eksperimental'noy Biologii i Meditsiny (Moskva). 81(2):188-190, 1976.

The effect of prolonged administration of nitrazepam on the sleep cycles of rats were investigated. Single and chronic administration of a low dose of nitrazepam (1mg/kg) resulted in prolongation of the total duration of synchronized sleep with a corresponding shortening of desynchronized (paradoxical) sleep; the number of sleep cycles was also reduced. Chronic injections of nitrazepam (7-14 days) in a dose of 10mg/kg evoked a gradual prolongation of the duration of paradoxical sleep and an increase in number of sleep cycles. After discontinuation of a long-term administration of nitrazepam, prolongation of desynchronized sleep and an increase in the number of sleep cycles were more pronounced in comparison with the last day of chronic administration of the drug. 18 references. (Journal abstract)

244469 Johnson, Alan Kim. University of Iowa, Iowa City, IA 52242 Analysis of hormonal mediation of drinking behavior. Final Report, NIMH Grant MH-25345, 1975. 7 p.

The nature of the mechanisms of action of angiotensin as a hormonal mediator of drinking behavior was investigated. A new competitive inhibitor of angiotensin II, saralasin acetate (formerly P-113), was employed as the entering wedge in this analysis. Consideration was given to the site of action of blood borne angiotensin and the role played by angiotensin as a mediator of experimentally induced thirst. The effects of intracranial injections of angiotensin inhibitor or control solutions were examined in animals in which drinking was induced by: 1) systemic angiotensin II injections; 2) s.c. hypertonic saline injections; 3) s.c. isoproterenol injections; and 4) a palatable solution. It was found that: 1) peripheral angiotensin appears to have a central site of action; 2) angiotensin does not appear to have a role in drinking resulting from cellular dehydration; and 3) at least some of the drinking in response to isoproterenol is mediated by the renin-angiotensin system. These findings provide the first independent evidence showing that circulating angiotensin acts on brain related dipsogenic angiotensin receptors.

244676 Fibiger, H. C.; Carter, D. A.; Phillips, A. G. Division of Neurological Sciences, Department of Psychiatry, University of British Columbia, Vancouver, B.C., Canada Decreased intracranial self-stimulation after neuroleptics or 6-hydroxydopamine: evidence for mediation by motor deficits rather than by reduced reward. Psychopharmacology (Berlin). 47(1):21-27, 1976.

Decreased intracranial self-stimulation after neuroleptics or 6-hydroxydopamine was studied in rats implanted with electrodes in the lateral hypothalamus placed on a 22 hour food deprivation schedule and trained to bar-press for intracranial self-stimulation (ICS) and for food on a continuous reinforcement (CRF) schedule. Haloperidol and pimozide significantly decreased responding for both reinforcers, although responding for ICS was decreased more than it was for food. When similar rates of responding for ICS and for food were obtained on a variable interval (VI) 60 schedule, haloperidol reduced responding for food and ICS to a similar extent. When baseline rate is controlled for, neuroleptics do not selectively reduce responding for ICS. Haloperidol produced a uniform decrease in the rate of responding throughout the experimental session. Similar results were obtained with intraventricular 6-hydroxydopamine (6-OHDA) injections. It is suggested that neuroleptics and 6-OHDA decrease responding for food or ICS primarily by impairing the function of dopaminergic systems critically involved in the initiation or maintenance of operant behavior. 30 references. (Author abstract modified)

244679 Cole, Sherwood O.; Gay, Patricia E. Rutgers University, Camden College of Arts and Sciences, Camden, NJ 08102 Effects of drug-state change on discrimination performance. Psychopharmacology (Berlin). 47(1):43-47, 1976.

The ability of drug state change to inhibit a behavior learned under conditions of cued positive reinforcement was investigated. A single dose of d-amphetamine (0.25, 0.50, or 1.00mg/kg) administered in five successive sessions, did not seriously impede the discrimination performance of male Holtzman rats under cued reinforcement conditions. A 2mg/kg dose produced a total cessation of operant behavior. In two postdrug (saline) sessions, groups previously treated with 0.50 or 1mg/kg demonstrated an initial decrement and subsequent recovery in performance. A second experiment demonstrated that rats administered either saline or 0.50mg/kg d-amphetamine for five successive sessions show a decrement and subsequent recovery in performance when switched to the opposite treatment condition for the next two sessions. These data can be explained in terms of a change in drug state. 5 references. (Author abstract)

244680 Church, A. C.; Fuller, J. L.; Dudek, B. C. Department of Psychology, State University of New York, Binghamton, NY 13901 Salsolinol differentially affects mice selected for sensitivity to alcohol. Psychopharmacology (Berlin). 47(1):49-52, 1976.

Salsolinol, a compound putatively formed following alcohol ingestion, differentially decreased the activity of lines of mice after 18 generations of genetic selection for alcohol sensitivity. Low doses of salsolinol produced significantly lower activity levels in the alcohol sensitive, long sleep (LS), line than in the alcohol insensitive, short sleep (SS), line. A hypnotic dose of salsolinol induced significantly longer sleep times in the LS line than in the SS line. Results are interpreted as supporting the hypothesis that salsolinol like substances may mediate some of the effects of alcohol on the central nervous system. 18 references. (Author abstract)

244682 Miczek, Klaus A. Department of Psychology, Carnegie-Mellon University, Pittsburgh, PA 15213 **Mouse-killing and motor activity: effects of chronic delta9-tetrahydrocannabinol and pilocarpine.** Psychopharmacology (Berlin). 47(1):59-64, 1976.

Mousekilling behavior induced in previously nonkiller rats through daily administration of high doses of delta9-tetrahydrocannabinol (THC) or pilocarpine was investigated. Chronic administration of THC for 5-8 weeks at four dose levels (2, 10, 20, 50mg/kg/day) or of pilocarpine (12.5, 25mg/kg/day) for 3 weeks induced mousekilling in 25% to 70% of previously nonkiller rats of the Sprague-Dawley strain. The maximum percent of drug induced mousekilling depended on the daily dose and housing conditions, 20mg/kg/day THC and 25mg/kg/day pilocarpine in single housed rats being the most effective treatments. Drug induced mousekilling appeared to be a form of behavioral pathology, differing from the species specific predatory response when it first appeared. Concurrent assessment of locomotor and rearing activities showed dose dependent depressant effects of THC and pilocarpine without evidence for tolerance. Different dose dependencies and time courses suggest that changes in motor activities are not directly linked to the appearance of the killing behavior. 22 references. (Author abstract)

244683 Hirschhorn, I. D.; Rosecrans, J. A. Department of Pharmacology, New York Medical College, Basic Science Bldg., Valhalla, NY 10595 **Generalization of morphine and lysergic acid diethylamide (LSD) stimulus properties to narcotic analgesics.** Psychopharmacology (Berlin). 47(1):65-69, 1976.

The ability of the stimulus properties of morphine and lysergic acid diethylamide (LSD) to generalize to several narcotic analgesics which vary in their subjective effects was studied. Morphine and saline served as discriminative stimuli for one group of rats in a two lever discrimination task. LSD and saline were discriminative stimuli for a second group. Depression of one lever in an operant chamber resulted in reinforcement following the administration of morphine or LSD, and the opposite lever was reinforced after saline. Stimulus generalization tests with narcotic analgesics and antagonists showed that the stimulus properties of morphine generalized to methadone and meperidine, and partially to pentazocine. Morphine stimulus properties did not generalize to nalorphine or cyclazocine. The stimulus properties of LSD generalized partially to cyclazocine, but not to nalorphine. In humans, cyclazocine and nalorphine produce a high incidence of psychotomimetic effects, but the subjective effects of cyclazocine are differentiable from those of LSD. 23 references. (Author abstract modified)

244684 Miller, Michael H. Department of Psychiatry, College of Medicine and Dentistry of New Jersey-Rutgers Medical School, Piscataway, NJ 08854 **Behavioral effects of amphetamine in a group of rhesus monkeys with lesions of dorsolateral frontal cortex.** Psychopharmacology (Berlin). 47(1):71-74, 1976.

The behavioral effects of amphetamine were studied in four macaques with lesions of dorsolateral frontal cortex and four normal monkeys injected with 1mg/kg d-amphetamine. Observations of social behaviors and motor activity were conducted over a one month period. A partial dissociation of effects of amphetamines on behavior of normal and frontally lesioned animals was found. The frontal monkeys showed a dramatic increase in hyperactivity while normal monkeys showed a variable motor response to the drug. Conspecific social interactions were disrupted by amphetamine in normal as well as le-

sioned animals. A functional system featuring the caudate nucleus and dorsolateral frontal cortex is presented. In addition, the possible influence of these areas on the balance of behavior modulated by limbic structures is explored. Changes in catecholamine levels are also hypothesized. 20 references. (Author abstract)

244685 Heilman, R. D.; Brugmans, M.; Greenslade, F. C.; DaVanzo, J. P. Ortho Pharmaceutical Corporation, Division of Pharmacology, Raritan, NJ 08869 **Resistance of androgen-mediated aggressive behavior in mice to flutamide, an antiandrogen.** Psychopharmacology (Berlin). 47(1):75-80, 1976.

Flutamide (alpha-alpha-alpha-trifluoro-2-methyl-4'-nitro-m-propionololuidide) (FTA) antagonization of isolation induced aggressive behavior in castrate, androgen replaced mice at doses that antagonized androgen stimulation of secondary sex organ weight was investigated. FTA, an antiandrogenic compound, inhibited the effects of methyltestosterone (MT) on the weight of the ventral prostate, seminal vesicles and levator ani in male castrate mice. Castration prevented the development of aggressive behavior in mice isolated for 3 weeks. While chronic administration of MT to castrate isolated mice returned the incidence of fighting behavior to control values, chronic administration of FTA + MT did not significantly reduce the incidence of fighting as compared to castrate + MT values. It is proposed that the mechanism for androgen stimulation of secondary sex organ weight may differ from that involved in the development and maintenance of aggression resulting from isolation. 32 references. (Author abstract)

244687 Dorr, Marian; Steinberg, Hannah. Department of Pharmacology, University College London, Gower Street, London, WC1E 6BT, England **Effects of delta9-tetrahydrocannabinol on social behaviour in mice: comparison between two vehicles.** Psychopharmacology (Berlin). 47(1):87-91, 1976.

Two vehicles for the intraperitoneal administration of delta9-tetrahydrocannabinol (delta9-THC) were compared, using aspects of social behavior in mice and five doses of delta9-THC, with vehicle alone and saline control groups. Ten percent propane-1,2-diol/1% Tween-80-saline (vehicle B) was more effective than 1% Tween 80-saline (vehicle A) since depressant effects of -1 delta9-THC on behavior tended to occur at lower doses with this vehicle. In general the overall number of behavioral acts decreased with increasing doses of delta9-THC, but with vehicle B low doses selectively decreased the number of "social" as distinct from "individual" acts. Low doses of the drug in vehicle A sometimes stimulated behavior, whereas with vehicle B such doses mostly produced depression; however, 2.5mg/kg delta9-THC, in either vehicle, markedly increased the percentage of animals which showed both aggression and flight acts. The findings are consistent with other evidence that propylene glycol is an effective vehicle for the i.p. administration of delta9-THC. 21 references. (Author abstract)

244690 Mereu, G. P.; Fratta, W.; Chessa, P.; Gessa, G. L. Institute of Pharmacology, University of Cagliari, Via Porcell 4, I-09100 Cagliari, Italy **Voraciousness induced in cats by benzodiazepines.** Psychopharmacology (Berlin). 47(1):101-103, 1976.

The appetite stimulant properties of the benzodiazepines were studied in cats. Different benzodiazepines, when administered to fasting cats, increased both the total amount of food eaten, and also the rate at which food was ingested. Moreover, when injected to food satiated cats, these compounds made them resume eating voraciously. Pentobarbital

also stimulated food intake, but was much less potent than the benzodiazepines tested. 9 references. (Author abstract)

244894 Chesher, G. B.; Jackson, D. M.; Malor, R. M. Department of Pharmacology, University of Sydney, N.S.W., 2006, Australia Interaction of delta9-tetrahydrocannabinol and cannabidiol with phenobarbitone in protecting mice from electrically induced convulsions. *Journal of Pharmacy and Pharmacology* (London). 27(8):608-609, 1975.

The potentiation by the cannabinoids of the effect of phenobarbitone on electrically induced seizures in mice is reported. The results show that delta9-tetrahydrocannabinol (THC) significantly potentiated the protection afforded mice by phenobarbitone when determined both by protection from seizures and by the shortening of the duration of hindlimb extension. Cannabidiol (CBD) was much less active, and while it significantly reduced the ED50 of phenobarbitone when assessed as protection from convulsions, it produced no significant change when effectiveness was assessed by the duration of hindlimb extension. The greatest potentiation was observed when both THC and CBD were administered together, before phenobarbitone. Despite the much lower activity of CBD, the combination of CBD and THC produced a reduction in the ED50 of phenobarbitone which was not significantly different from that produced by THC. 9 references.

244899 Poignant, J.-C.; Rismondo, N. Department de Neuro-Psychopharmacologie, Institut de Recherches Servier, Suresnes, France /Influence of the administration of psychopharmacological compounds on the take up time of an alimentary material in the hamster and a study of related behavior./ Influence de l'administration de composés neurotropes sur le temps de ramassage d'un matériel alimentaire chez le hamster, et étude de comportement associée. *Psychopharmacologia* (Berlin). 43(1):47-52, 1975.

The effects of diazepam, chlorpromazine, meprobamate, apomorphine, d-amphetamine, piritol, fenfluramine, sulpiride, imipramine, phenobarbital, clonidine and morphine on the take up time of a standardized alimentary material were examined as a component of hamster boarding behavior. The change consisted of a varying increase in the take up time, dependent upon the substance and dosage. High doses of chlorpromazine, apomorphine and fenfluramine inhibited the take up. Some behavioral modifications (increase or decrease in motor activity, myorelaxation, stereotyped exploration, reciprocating movements) demonstrated differences between the studied compounds related to their pharmacological properties. The immediate consumption of food, without take up and hoarding behavior, observed with meprobamate treatment, was an interesting and unexpected change in hamster behavior. 21 references. (Author abstract modified)

244911 Clineschmidt, B. V.; McGuffin, J. C.; Pflueger, A. Barbara; Totaro, J. A. Merck Institute for Therapeutic Research, West Point, PA 19486 Fenfluramine-induced enhancement of confinement motor activity: an indirect 5-hydroxytryptamine like action? *Neuropharmacology* (Oxford). 14(4):301-311, 1975.

The effect of fenfluramine, administered to rats at anorectic dose levels was examined. The drug reduced open field activity and enhanced confinement motor activity, demonstrating the mixed depressant and stimulant characteristics of the compound. Confinement motor activity was also increased by giving MK-486 + 5-hydroxytryptophan. Methergoline and cinanserin, antagonists of 5-hydroxytryptamine, reduced the confinement motor activity enhancing actions of fenfluramine and

MK-486 + 5-hydroxytryptamine, reduced the confinement motor activity enhancing actions of fenfluramine and MK-486 + 5-hydroxytryptophan but not that of methylphenidate. Following p-chlorophenylalanine induced reduction in brain monoamines it was concluded that fenfluramine increases confinement motor activity via a 5-hydroxytryptamine like action. That this action of fenfluramine was affected by both p-chlorophenylalanine and 5,6-dihydroxytryptamine indicates an interaction with central 5-hydroxytryptamine containing neurons. Denervation supersensitivity in 5,6-dihydroxytryptamine treated animals may account for the opposite nature of the effect produced by pretreatment with p-chlorophenylalanine and 5,6-dihydroxytryptamine. 40 references. (Author abstract modified)

245295 Voith, Katherine; Herr, Francis. Department of Pharmacology, Ayerst Research Laboratories, Montreal, Canada H3C 3J1 The behavioral pharmacology of butaclamol hydrochloride (AY-23,028), a new potent neuroleptic drug. *Psychopharmacologia* (Berlin). 42(1):11-20, 1975.

A pharmacological investigation of butaclamol hydrochloride (AY-23,028) was conducted to determine its effects on mice, rats and dogs. The compound was found to antagonize amphetamine induced stereotyped behavior in rats, amphetamine toxicity in aggregated mice and apomorphine induced emesis in dogs. It depressed both discriminated avoidance and continuous leverpressing behavior in rats and inhibited ambulation and rearing in the open field. At higher doses, AY-23,028 induced catalepsy. Adrenergic blocking activity, measured by the antagonism of epinephrine induced mortality, was considered weak. These pharmacological actions are characteristic of neuroleptic drugs. In the dose range where aforementioned effects were observed, AY-23,028 did not antagonize either the tetrabenazine induced ptosis or the tremorine syndrome and did not cause either hypothermia or ataxia. On the basis of experimental findings, it is predicted that clinically AY-23,028 would be a potent antipsychotic drug. The potency and onset of action of AY-23,028 were comparable to those of fluphenazine but AY-23,028 was of longer duration. Results are discussed in relation to current concepts of neuroleptic mechanisms. 43 references. (Author abstract modified)

245297 Jarbe, Torbjorn U. C.; Johansson, Jan O.; Henriksson, Bengt G. Department of Psychology, University of Uppsala, Clin. and Physiol. Sect., Slottsgård 3, S-752 20 Uppsala, Sweden Drug discrimination in rats: the effects of phenacyclidine and ditran. *Psychopharmacologia* (Berlin). 42(1):33-39, 1975.

Choice responding in a T shaped maze was made contingent upon whether or not rats experienced certain drug effects. The drug discriminative cues used in the state/dependent model were those of phenacyclidine (PCP) and ditran. It was found that the lower the training dose used, the slower the appearance of the drug discriminative formation. Transfer testings with ketamine and cyclohexamine showed that they were interchangeable with PCP. The order of their relative potency was: cyclohexamine and PCP and ketamine. Atropine transferred to ditran. Administration of compounds not structurally related to the training drugs did not show transfer. Pretreatment with parachlorophenylalanine or tetrabenazine plus imipramine did not indicate inhibition or antagonism in PCP trained rats. Tacrine and especially physostigmine effectively antagonized the ditran induced cues. Yohimbine and neostigmine did not. Further pharmacological and clinical studies of antagonists are recommended. 33 references. (Author abstract modified)

245299 York, James L.; Winter, J. C. New York State Research Institute on Alcoholism, 1021 Main Street, Buffalo, NY 14203 Long-term effects of barbitol on spontaneous activity of rats trained to use the drug as a discriminative stimulus. *Psychopharmacologia* (Berlin). 42(1):47-50, 1975.

An investigation was conducted to determine if the discriminative stimulus properties of barbitol are reflected in the pattern of spontaneous motor activity induced by the drug. Rats were trained in a Skinner box to discriminate the effects of sodium barbitol (80 mg/kg), injected 60 min prior to training, from those of saline. Half the animals (Group 1) were taught the drug discrimination by rewarding them for bar pressing only when they were in the drug condition. The other half of the animals (Group 2) were rewarded only in the absence of the effects of barbitol. Spontaneous motor activity was monitored during the 20 min period from 40 to 60 min after injection of the drug or saline. After several months of drug discrimination training, the patterns of spontaneous activity displayed by all animals suggested that the treatments had become conditioned to signal the forthcoming availability or nonavailability of food in the Skinner box. The data suggest that chronic exposure to barbitol may have induced adaptations which allowed the drug to increase spontaneous motor activity. 11 references. (Author abstract)

245301 Pearlman, Chester; Becker, Michael. Veterans Administration Hospital, 130 S. Huntington Avenue, Boston, MA 02130 Retroactive impairment of cooperative learning by imipramine and chlordiazepoxide in rats. *Psychopharmacologia* (Berlin). 42(1):63-66, 1975.

In an investigation of retroactive impairment of cooperative learning by imipramine and chlordiazepoxide in rats, pairs of rats were placed in an apparatus where their sole food source hung over an electrified grid. The current was shut off only while one rat remained on a platform out of reach of the food, thus allowing his partner to eat. Mastery of the process of taking turns at eating required about ten daily sessions. Injection of imipramine or chlordiazepoxide a few minutes after each feeding session prevented the development of this cooperative behavior. Drug injection 3 hours after each session had no effect. Suppression of REM sleep during the first 3 hours after training was considered the most likely mechanism of the drug induced impairment. It is noted that the results may indicate more clearly the types of learning which require REM sleep. 16 references. (Author abstract modified)

245303 Branch, Marc N. Department of Psychology, University of Florida, Gainesville, FL 32611 Effects of chlorpromazine and d-amphetamine on observing responses during a fixed-interval schedule. *Psychopharmacologia* (Berlin). 42(1):87-93, 1975.

The effects of chlorpromazine and d-amphetamine on observing responses during a fixed interval schedule were investigated in pigeons trained to peck a response key that briefly produced stimuli correlated with the passage of time in a fixed interval schedule of food presentation for pecks on another response key. Pecks on the key that produced food were most likely near the end of each fixed interval, whereas pecks on the key that produced the discriminative stimuli were most likely to occur during the middle portion of each fixed interval. Chlorpromazine and d-amphetamine produced inverted U shaped dose effect curves with response rate on the food producing key as the dependent variable, and monotonically decreasing functions were obtained for the discriminative stimulus producing responses. A rate dependency interpretation described the drug effects on the temporal distribution of

pecks on the food producing key, but was not consistent with the disruption of the temporal distribution of pecks on the key that produced the discriminative stimuli. The pecks on the discriminative stimulus producing key had some of the properties of schedule induced, or adjunctive, behavior. The effects of amphetamine and chlorpromazine on the rate of adjunctive behaviors may not be predictable from control rates. 37 references. (Author abstract modified)

245304 Juvancz, P.; Nowaczky, T. Institute of Pharmacology, Semmelweis University, H-1085 Budapest VIII, Ulloi Ut 26, Hungary Effects of early post-natal alpha-methyl-dopa treatment on behavior in the rat. *Psychopharmacologia* (Berlin). 42(1):95-97, 1975.

The effects of early postnatal alpha-methyl-dopa (alpha-m-Dopa) treatment on behavior in the rat were studied. Two hundred and fifty mg/kg of the alpha-m-Dopa or saline were administered to rats for three weeks after birth. Subsequent tests revealed an increased locomotor activity and greater rate of acquisition in druged rats, but no disturbance in their shuttlebox conditioning. The whole brain content of norepinephrine, dopamine, and serotonin was not affected. Results are considered to demonstrate an increased excitability and locomotor activity due to early postnatal alpha-m-Dopa treatment. Two alternatives are suggested as possible explanations of findings: either the relationship between paradoxical sleep (PS) and the maturation of the central nervous system might not operate or at least not in this simple form; or PS was not sufficiently deprived. 13 references. (Author abstract modified)

245305 Phillips, Keith C.; Lowe, G. Department of Psychology, University of Hull, Hull HU6 7RX, England The suppression of behaviour in rats by previous experience and electric shock and its antagonism by atropine. *Psychopharmacologia* (Berlin). 42(1):99-103, 1975.

An experiment was conducted to examine the effects of atropine, in the rat, upon a number of behavioral parameters suppressed by previous exposure to the test situation or by a combination of previous exposure and unavoidable electric foot shock. Findings confirm original hypothesis that atropine antagonized habituation and shock induced suppression, suggesting that behavioral suppression however induced, may depend upon a common neuropharmacological mechanism, probably cholinergic. 28 references. (Author abstract modified)

245406 Svare, Bruce; Gandelman, Ronald. Department of Psychology, Rutgers University, New Brunswick, NJ 08903 Aggressive behavior of juvenile mice: influence of androgen and olfactory stimuli. *Developmental Psychobiology*. 8(5):405-415, 1975.

A study was conducted to investigate whether the aggressive behavior of juvenile male and female mice is influenced by the presence or absence of androgen, and whether the aggressive behavior of juvenile and androgenized mice is influenced by olfactory stimuli. Testosterone propionate (TP), administered from day 21 to day 50 of life, was observed to enhance the aggressiveness of castrated and neonatally TP treated juvenile male and female mice and, to a lesser extent, the aggressiveness of neonatally androgenized females. The enhanced aggressive behavior of juvenile male and female mice was principally directed toward juvenile male rather than female opponents, and was inhibited by the application of urine from juvenile females to the fur of juvenile male opponents. Results indicate that androgen and olfactory stimuli modulate the aggressive behavior of juvenile mice in a manner similar to that of adult animals. 27 references. (Author abstract modified)

245486 Anisman, Hymie. Department of Psychology, Carleton University, Ottawa, Ontario, K1S 5B6, Canada **Time-dependent variations in aversively motivated behaviors: nonassociative effects of cholinergic and catecholaminergic activity.** *Psychological Review*. 82(5):359-385, 1975.

The role of acetylcholine and central nervous system catecholamines in modulating aversively motivated behaviors and behavior following exposure to uncontrollable stressors is evaluated in Holtzman rats. It is suggested that in the presence of adequate associative processes, nonassociative factors mediated by stress induced neurochemical changes determine avoidance response rates. Moreover, in addition to the balanced state observed between excitatory catecholamine and inhibitory cholinergic systems, it is posited that these systems may be mutually regulatory. Excessive stimulation of one system may induce a compensatory antagonistic rebound in the complementary system, thereby maintaining neurochemical homeostasis. Owing to time dependent variations in neurotransmitter activity, temporal variations in performance may occur following initial exposure to aversive stimulation. Alterations in neurochemical activity that affect nonassociative processes have predictable effects on time dependent variations in avoidance performance. The model is extended to deal with other stress related phenomena such as helplessness, depression, and ulceration. 177 references. (Author abstract)

245594 Glick, S. D.; Crane, A. M.; Barker, L. A.; Mittag, T. W. Dept. of Pharmacology, Mount Sinai School of Medicine, New York, NY 10029 **Effects of N-hydroxyethyl-pyrrolidinium methiodide, a choline analogue, on passive avoidance behaviour in mice.** *Neuropharmacology* (Oxford). 14(8):561-564, 1975.

The effects of n-hydroxyethyl-pyrrolidinium methiodides, a choline analogue, on passive avoidance behavior in mice are studied. Results reveal that pyrrolcholine administered intraventricularly impaired passive avoidance learning in mice, was antagonized by choline and hemicholinium-3, potentiated by scopolamine, and depending upon the time of injection, was either potentiated or antagonized by physostigmine. The results are considered to be consistent with the hypothesis that pyrrolcholine disrupts central cholinergic pathways by a presynaptic mechanism. On the basis of metabolism studies both in vivo and in vitro, it is postulated that the action of pyrrolcholine is mediated by acetylpyrrolcholine, a putative cholinergic false transmitter. Experimentation is suggested to determine whether pyrrolcholine is a precursor to a false transmitter with little or no agonist activity at muscarinic cholinergic receptors in the CNS. 10 references. (Author abstract modified)

245600 Green, A. R.; Hughest, Janet P.; Tordoff, Ann F. C. MRC Unit and University Department of Clinical Pharmacology, Radcliffe Infirmary, Oxford OX2 6HE, England **The concentration of 5-methoxytryptamine in rat brain and its effects on behaviour following its peripheral injection.** *Neuropharmacology* (Oxford). 14(8):601-606, 1975.

Behavioral effects of intraperitoneal 5-methoxytryptamine are studied in the rat brain. The concentration of 5-methoxytryptamine in the rat brain increased linearly with time over 30 minutes after injection intraperitoneally, causing transient behavioral changes (hyperactivity, paw padding, tremor, shivering, atetoxia, ataxia of back legs, head weaving). When the dose was given after tranlycypromine pretreatment, these behavioral changes were considerably enhanced. Pretreatment of rats with p-chlorophenylalanine or tetrabenazine did not alter the behavioral responses to 5-methoxytryptamine. The behavioral changes were similar to those seen following tranly-

cypromine and L-tryptophan, which increase 5-hydroxytryptamine synthesis in the brain. Intraperitoneal injection of 5-hydroxytryptamine which produces similar effects to 5-methoxytryptamine in isolated tissue preparations but which does not enter the brain, did not cause behavioral changes, nor did intraperitoneal injection of melatonin. 21 references. (Author abstract modified)

245601 Hine, B.; Friedman, E.; Torrello, Marine; Gershon, S. Neuropsychopharmacology Research Unit, Dept. of Psychiatry, New York University Medical Center, 550 First Ave., New York, NY 10016 **Tetrahydrocannabinol-attenuated abstinence and induced rotation in morphine-dependent rats: possible involvement of dopamine.** *Neuropharmacology* (Oxford). 14(8):607-610, 1975.

The occurrence and strength of spontaneous turning, or rotational behavior in the tetrahydrocannabinol treated, morphine dependent rats during precipitated abstinence is studied. Rotational behavior (turning) was induced in morphine dependent rats during abstinence following pretreatment with delta-8 or delta-9 tetrahydrocannabinol. Turning behavior varied with the degree of morphine dependence and was blocked by haloperidol but not by promethazine. Significant attenuation of naloxone induced abstinence signs was also observed after acute tetrahydrocannabinol pretreatment but only in highly (72 hour) morphine dependent rats. The combination of tetrahydrocannabinol and haloperidol treatment was found to be more effective than either alone. It is suggested that data provide additional evidence for the alteration of CNS dopaminergic function in morphine dependence. 7 references. (Author abstract modified)

245602 Babbini, M.; Guaiardi, M.; Bartoletti, M. Institute of Pharmacology, University of Bologna, Italy **Persistence of chronic morphine effects upon activity in rats 8 months after ceasing the treatment.** *Neuropharmacology* (Oxford). 14(8):611-614, 1975.

Persistence of effects of chronic morphine treatment (tolerance, motility, excitation) is studied in rats. Twelve rats were treated daily with 20 mg/kg of morphine KCl for 59 days and motility was registered for 7 hours after each treatment with jiggle cage actometers. Animals were then tested for persistence of chronic morphine effect upon activity and given the same dose on days 20, 40, 80, 160, and 240 after ceasing the treatment. The initial depression of activity rapidly underwent tolerance (4 to 6 days) and then gradually changed into excitation. This disappeared when the animals were tested 20 days after their last morphine dose but the depressive phase was not resumed; motility began on a control level. Similar results were obtained on other testing days. Contrarily, a delayed excitatory effect that increased over the days when morphine was given chronically remained unchanged when the same dose was given 8 months after the cessation of chronic treatment. It is suggested that after chronic dosing, the excitatory effect is not only unmasked but enhanced by a progressively increased sensitivity of the cell body receptor. 13 references. (Author abstract modified)

245712 Andrew, R. J. School of Biological Sciences, University of Sussex, Brighton, England **Effects of testosterone on the behaviour of the domestic chick. I. effects present in males but not in females.** *Animal Behaviour* (London). 23(1):139-155, 1975.

The effects of testosterone on the behavior of young chicks is examined in regards to dosage dependency and whether effects are shown by both sexes or only in males. In male

chicks, specific facilitation of male copulatory movements occurs at a lower dose of testosterone oenanthate than does facilitation of approach to the test object, or of attack. It is felt that the latter effects may depend upon a single central change in visual responsiveness or persistence. Females show none of these changes, although they are capable of the behavior involved, and do respond to testosterone in other ways. On day three of life, normal males copulate and attack more, and flee less, than do females. Other behaviors such as pecking and hackle raising were also investigated, and male/female comparisons are reported. 26 references. (Author abstract modified)

245713 Andrew, R. J. School of Biological Sciences, University of Sussex, Brighton, England **Effects of testosterone on the behaviour of the domestic chick. II. effects present in both sexes.** *Animal Behaviour* (London). 23(1):156-168, 1975.

The effects of testosterone on the behavior of young chicks was studied in order to determine whether changes depend on general effects on attention or perceptual mechanisms rather than on specific changes in the threshold of particular responses, and to examine dosage dependency of each change in both sexes. In female chicks, testosterone is found to increase both binocular fixation on a thrusting hand and avoidance of direct gaze. Males show signs of such changes, which are obscured by a locking of attention on the hand, along with head shaking and pecking. It is felt that the latter three effects, as well as later full attacks on the intruding hand, may be a consequence of testosterone. In both sexes testosterone facilitates waltzing and three characteristic calls, probably by specific effects. Latencies and dosage dependency are the same in both sexes. Ten changes in behavior due to testosterone are explained by reference to as few as five basic effects, both general and specific. 37 references. (Author abstract modified)

246093 Revusky, Sam; Taukulis, Harald. Psychology Dept., Memorial University of Newfoundland, St. John's, Newfoundland, Canada **Effects of alcohol and lithium habituation on the development of alcohol aversions through contingent lithium injection.** *Behaviour Research and Therapy* (Oxford). 13(2-3):163-166, 1975.

An experiment was conducted with rats to demonstrate the effects of flavor habituation and sickness habituation on the formation of a learned aversion alcohol solution through contingent lithium injection. Results show that prior habituation to the flavor of alcohol and to lithium sickness each interfere with development of a learned aversion to alcohol. It is suggested that this may explain why learned aversions to alcohol produced by chemical aversion therapy are not as pronounced as flavor aversions produced in laboratory animals. 11 references. (Author abstract modified)

246148 Florio, V.; Bianchi, L.; Longo, V. G. Istituto Superiore di Sanita, Viale Regina Elena 299, Rome 00161, Italy **A study of the central effects of sympathomimetic drugs: EEG and behavioural investigations on clonidine and naphazoline.** *Neuropharmacology* (Oxford). 14(10):707-714, 1975.

The effect of clonidine and naphazoline on the EEG and behavior of rats, rabbits and cats and the modifications of these effects by alpha-adrenolytic drugs and other compounds acting on the sympathetic system are studied. Clonidine and naphazoline induced behavioral depression and EEG synchronization in all animal species studied. These effects were prevented by the administration of tolazoline, phenolamine and yohimbine, but not by phenoxybenzamine. Pretreatment with alpha-methyl-p-tyrosine was only partially

effective in preventing the EEG synchronization due to clonidine. Reserpine was without effect. Amphetamine proved able to reverse the effects of clonidine and furthermore, clonidine attenuated the behavioral and EEG changes due to amphetamine. These data suggest that clonidine and naphazoline induce sedation and EEG synchronization through stimulation of the central alpha-adrenergic receptors. 16 references. (Author abstract)

246150 Baldessarini, R. J.; Walton, K. G.; Borgman, R. J. Psychiatry Dept., Harvard Medical School, Boston, MA 02114 **Esters of apomorphine and N,N-dimethyldopamine as agonists of dopamine receptors in the rat brain in vivo.** *Neuropharmacology* (Oxford). 14(10):725-731, 1975.

Aspects of the behavioral actions of certain catechol esters on the activity of dopamine sensitive adenylate cyclase in homogenates prepared from rat corpus striatum were investigated. Subcutaneous injections of O,O'-diacetylapomorphine, at doses of 0.1 to 10.0 mg/kg, produced stereotyped gnawing behavior in the rat, indistinguishable from that induced by apomorphine. The dose/response relationship and time course of this effect were similar for the two drugs, although the ester appeared to be somewhat more potent and longer lasting at higher doses. While apomorphine had no behavioral effects when given orally at doses up to 100 mg/kg, diacetylapomorphine produced discernible stereotypy at oral doses as low as 10 mg/kg. The injection of diacetylapomorphine into animals previously lesioned electrothermally in the left nigrostriatal tract provoked turning behavior toward the side contralateral to the lesions, with an effectiveness similar to that of apomorphine. Apomorphine, but not diacetylapomorphine, stimulated the production of cyclic AMP when incubated with homogenates of corpus striatum. In analogous experiments, N,N-dimethyldopamine, but not its ester, O,O'-diacetyl-N,N-dimethyldopamine (another apparent agonist of central dopamine receptors in vivo), also stimulated the production of cyclic AMP in homogenates, and a similar failure to stimulate the production of cyclic AMP was obtained with O,O'-dibenzylapomorphine, which had prolonged behavioral effects in vivo. These results are considered compatible with the conclusion that catechol esters of certain structural analogues of dopamine can be hydrolyzed in vivo to yield free catechols capable of stimulating central dopamine receptors. 22 references. (Author abstract modified)

246306 Sanger, D. J.; Blackman, D. E. Psychology Dept., Univ. of Birmingham, P. O. Box 363, Birmingham B15 2TT, England **The effects of tranquillizing drugs on timing behaviour in rats.** *Psychopharmacologia* (Berlin). 44(2):153-156, 1975.

Timing behavior generated in rats by a schedule which required responses to be spaced at least 15 sec apart in order for them to produce food reinforcement (DRL 15 sec), is studied after administration of chlordiazepoxide, phenobarbitone and chlorpromazine. Several doses of both chlordiazepoxide and phenobarbitone were found to disrupt timing behavior by increasing overall response rates although the highest dose of each of these two drugs produced sedative effects. Chlorpromazine produced mainly a decrease in overall response rates. Analysis of performance in terms of interresponse times (IRTs) showed that both chlordiazepoxide and phenobarbitone markedly increased the percentage of IRTs less than 1.5 sec in duration (response bursts). Chlorpromazine had no consistent effect on response bursts. Reduction of the animals' bodyweights from 85% to 75% of their preexperimental levels had no effect on operant performance, suggesting that the effects of the drugs were probably not due to actions on motivational processes. 25 references. (Author abstract)

246310 Cutler, Margaret G.; MacKintosh, John H.; Chance, Michael R. A. Sub-Department of Ethology, The Medical School, Birmingham B15 2TJ, England **Behavioural changes in laboratory mice during cannabis feeding and withdrawal.** *Psychopharmacologia* (Berlin). 44(2):173-177, 1975.

The effects of feeding cannabis at a level of 0.4% in the diet are studied by an ethological analysis of encounters between male mice. Administration of cannabis to dominant males resulted in a reduction of nonsocial activity, an increase in flight, and an increase in social and sexual investigation when compared with untreated controls; the behavior of subordinate males was not significantly altered by cannabis. One week after withdrawal of cannabis, the behavior of dominant males showed a rebound effect with increase in aggression. Nevertheless, by a preference feeding test it was demonstrated that the treated mice were not dependent on the cannabis containing diet but consumed the control diet in preference. 22 references. (Author abstract)

246313 Seliger, Deborah Levy. Psychology Dept., Rutgers -- The State University, Camden, NJ 08102 **Dose-response effects of d-amphetamine on passive avoidance learning in the rat.** *Psychopharmacologia* (Berlin). 44(2):191-193, 1975.

Trials and errors to learning a passive avoidance response are assessed in 63 albino rats injected subcutaneously with d-amphetamine, in amounts ranging from 0 to 7mg/kg bodyweight. Both measures indicated dose response effects on responding; animals under either low or high doses of d-amphetamine made significantly less errors and took significantly fewer trials to learn the response than did middle dosage animals. Scores of the lower and higher dosage animals did not differ from the nondrug control group. Results are discussed in terms of amphetamine stereotypy. 7 references. (Author abstract)

246318 Schaefer, Andras; Komlos, Marta; Seregi, Andras. Inst. of Experimental Medicine, Hungarian Academy of Sciences, 1450 Budapest 9, P.O.B. 67, Hungary **Lipid peroxidation as the cause of the ascorbic acid induced decrease of adenosine triphosphatase activities of rat brain microsomes and its inhibition by biogenic amines and psychotropic drugs.** *Biochemical Pharmacology* (Oxford). 24(19):1781-1786, 1975.

The inhibitory effect of ascorbic acid on microsomal Na(+), K(+)-ATPase and Mg(2+)-ATPase activities of rat brain and the ability of several mediator substances and of many drugs acting on the nervous system to antagonize this inhibition is studied. The maximal effect of ascorbic acid on ATPase activities was completely antagonized by catecholamines, apomorphine, oxypertine, reserpine, tetraabenazine, phenothiazines (chlorpromazine and promethazine) and yohimbine. Apomorphine proved to be the most effective compound, fully antagonizing the effect of ascorbic acid at a concentration of 10-6M. A partial inhibition of the effect of ascorbic acid was induced by 10-4M serotonin, desipramine, imipramine and LSD. During the incubation of the microsomes for ATPase activity determinations in the presence of ascorbic acid, a significant amount of lipid peroxide was formed. Compounds which antagonized the effect of ascorbic acid on the ATPase activities inhibited at the same concentrations the lipid peroxide formation. The well known inhibitors of lipid peroxidation eliminated the effect of ascorbic acid on the ATPase activities. It has been established that the inhibition of ATPase activities by ascorbic acid is a consequence of lipid peroxidation. The mechanism of action of the antagonizing compounds is discussed. 32 references. (Author abstract)

246388 Borbely, Alexander A.; Jost, Martin; Huston, Joseph P.; Waser, Peter G. Pharmakologisches Institut der Universität Zurich, Gloriastrasse 32, CH-8006, Zurich, Switzerland **Caffeine and chlordiazepoxide: effects on motor activity in the chronic thalamic rat.** *Archives of Pharmacology* (Berlin). 290(2-3):285-296, 1975.

The effects of three doses of caffeine and of chlordiazepoxide (CDX) on motor activity are tested in the chronic thalamic rat. In this preparation virtually all cortical, striatal and limbic structures were ablated. Results show that a small dose of caffeine had only a weak motor stimulant effect which was succeeded by sedation. Larger doses that are stimulatory in intact animals, depressed motor activity in the thalamic rat. Amphetamine, in contrast to caffeine, produced a substantial motor stimulation. CDX caused a dose dependent reduction of motor activity, similar to its effect in the intact rat. It is concluded that 1) telencephalic structures are involved in mediating the stimulatory action of caffeine; 2) a sedative component of caffeine may be present, but masked, in the intact animal, and may be due to serotonergic mechanisms; and 3) the presence of limbic structures is not necessary for the sedative effect of CDX. 29 references. (Author abstract)

246664 Ozawa, Hikaru; Miyauchi, Tatsuo; Sugawara, Kazunobu. Pharmacology Department, Pharmaceutical Institute, Tohoku University, Sendai, Japan **Potentiating effect of lithium chloride on aggressive behaviour induced in mice by nialamide plus L-Dopa and by clonidine.** *European Journal of Pharmacology* (Amsterdam). 34(1):169-179, 1975.

The effects of acute administration of lithium chloride (LiCl) on aggressive behavior and alterations in brain norepinephrine (NE), dopamine (DA) and serotonin (5-HT) contents induced by nialamide plus L-Dopa and by clonidine were examined in mice. Effects of LiCl on turnover and metabolism of brain NE were also investigated. It was found that LiCl potentiated the aggressiveness induced by both nialamide plus L-Dopa and by clonidine. Increase in levels of brain NE, DA and 5-HT by nialamide plus L-Dopa was not affected by LiCl. The potentiating effect of LiCl on clonidine aggression was not observed in mice pretreated with disulfiram. Although LiCl did not alter the steady state levels of brain NE, DA and 5-HT, it increased the turnover of NE and decreased the content of endogenous normetanephrine. Results favor the assumption that lithium reduces the ability of nerve terminal vesicles to store NE leading to an increased turnover and decreased concentration of NE at receptor sites. 71 references. (Author abstract modified)

246674 Kreiskott, H.; Hofmann, H. P. Neuropharmacological Department, Knoll AG, 67 Ludwigshafen/Rhein, Germany **Stimulation of a specific drive (predatory behaviour) by p-chlorophenylalanine (pCPA) in the rat.** *Pharmakopsychiatrie Neuro-Psychopharmacologie* (Stuttgart). 8(3):136-140, 1975.

The effect of p-chlorophenylalanine (pCPA) on predatory behavior in selected nonbiting rats was studied in terms of dose dependence and time dependence after single and repeated drug administration. D-isomers and L-isomers of pCPA were included in the investigation. After single oral application of 200 to 3200 mg/kg DL-pCPA, a dose dependent stimulation of predatory behavior was found. Smaller doses (200 or 400 mg/kg p.o.) given repeatedly on 3 consecutive days showed effects comparable with those after single administration of much higher doses (1600 or 3200 mg/kg p.o.). With repeated oral application of 30, 100, or 200 mg/kg on 10 consecutive days no difference was found between D-pCPA and L-dCPA concerning efficacy and time course of drug effect. Both after

single and repeated administration in all series of tests, the effect reached its maximum not before several days and faded almost completely in the drug-free after period. D-methamphetamine HCl, investigated comparatively as a CNS stimulant, provoked no predatory behavior in a wide dose range (0.125 to 8.0mg/kg p.o.) with repeated administration on 10 consecutive days. Within the control groups no animal showed predatory attack during an observation period of at least 3 weeks. 14 references. (Journal abstract modified)

246818 Ruiz, Marta; Monti, J. M. Departamento de Farmacología y Terapéutica, Laboratorio de Psicofarmacología, Hospital de Clínicas, Montevideo, Uruguay **Reversal of the 6-hydroxydopamine-induced suppression of a CAR by drugs facilitating central catecholaminergic mechanisms.** Pharmacology (Basel). 13(4):281-286, 1975.

Several experiments undertaken to test the hypothesis that treatments which increase the catecholamine (CA) levels or stimulate appropriate receptors would induce the reappearance of a previously conditioned response are described and discussed. Intraventricular injection of 6-hydroxydopamine (200 microg) was used to block a previously learned conditioned avoidance response (CAR) in rats. It was found that the subsequent administration of 1-norepinephrine (NE), 1-dihydroxyphenylalanine (DOPA), amphetamine, phenelzine, desipramine and clonidine induced the reappearance of the CAR. These results are discussed in relation to current hypotheses on the mechanism of action of 6-hydroxydopamine on the central nervous system. 8 references. (Author abstract modified)

246819 Pandina, Robert J.; Musty, Richard E. Psychology Dept., Univ. of Vermont, Burlington, VT 05401 **Effects of delta9-tetrahydrocannabinol on active avoidance acquisition and passive avoidance retention in rats with amygdaloid lesions.** Pharmacology (Basel). 13(4):297-308, 1975.

Two experiments on the effects of delta9-tetrahydrocannabinol on active avoidance acquisition and passive avoidance retention in rats with amygdaloid lesions are described and discussed. Delta9-tetrahydrocannabinol was administered to rats with basolateral amygdaloid lesions, control rats, and normal rats in doses of 0.75, 1.5, and 3.0mg/kg i.v. They were trained in a one session two way active avoidance task. It was found that delta9-tetrahydrocannabinol increased the percentage of avoidances and the intertrial crossing rates in all groups, regardless of lesion treatment. Rats with basolateral amygdaloid lesions were not different from controls on any measure. In a second experiment, delta9-tetrahydrocannabinol was administered to rats with basolateral amygdaloid lesions and control rats in doses of 0.75 and 3.0mg/kg 24 hr after learning of a one trial passive avoidance task, and retention was measured. No differences were found as a function of drug treatment or lesion condition. It is concluded that the basolateral amygdala is not a necessary condition for the action of delta9-tetrahydrocannabinol on active avoidance acquisition, that the drug has no effect on passive avoidance retention, and the basolateral amygdala is not necessary for two way active avoidance acquisition or passive avoidance retention. Active avoidance results are discussed in terms of a possible relationship between delta9-tetrahydrocannabinol, ACTH, and avoidance learning. 22 references. (Author abstract modified)

246820 Ulus, Ismail H.; Kiran, Burhan K.; Ozkurt, Serafettin. Bursa Tip Fakültesi, Farmakoloji ve Klinik Farmakoloji, Bolu, Bursa, Turkey **Involvement of central dopamine in the**

hyperthermia in rats produced by d-amphetamine. Pharmacology (Basel). 13(4):309-316, 1975.

The effect of amphetamine on the body temperature was studied in 6-hydroxydopamine and pimozide pretreated rats. It was found that amphetamine alone (1, 2.5 and 5 mg/kg) produced a fairly dose dependent increase in body temperature. It was expected that these treatments would help to assess the possible role of central dopamine for the amphetamine induced hyperthermia. The effect was almost totally antagonized by pimozide, and also reduced after pretreatment with 6-hydroxydopamine. Results were found to strongly support the theory that central dopaminergic neurons are involved in the medication of the development of hyperthermia against amphetamine. 35 references. (Author abstract modified)

246852 Pedigo, Norman W.; Dewey, William L.; Harris, Louis S. Dept. of Pharmacology, Medical College of Virginia, Richmond, VA 23298 **Determination and characterization of the antinociceptive activity of intraventricularly administered acetylcholine in mice.** Journal of Pharmacology and Experimental Therapeutics. 193(3):845-852, 1975.

The antinociceptive activity of intraventricularly administered acetylcholine in mice is reported by the tail flick and phenyl quinone tests. A dose response curve is established for acetylcholine which is potentiated by intraventricular neostigmine and blocked by intraperitoneal atropine, but not by atropine methyl nitrate or mecamlamine. Results establish a phenomenon of acetylcholine induced antinociception and identify the central muscarinic nature of the response. In addition, several experiments demonstrate similarities between this phenomenon and morphine induced antinociception. Data implicate the possible involvement of central cholinergic mechanisms in the antinociceptive action of morphine. 34 references. (Author abstract modified)

246853 Witter, Albert; Greven, Henk M.; De Wied, David. Rudolf Magnus Institute for Pharmacology, Vondellaan 6, Utrecht, The Netherlands **Correlation between structure, behavioral activity and rate of biotransformation of some ACTH4-9 analogs.** Journal of Pharmacology and Experimental Therapeutics. 193(3):853-860, 1975.

The effect of substitutions in adrenocorticotropin (ACTH4-9) on extinction of pole jumping avoidance behavior in intact rats is investigated. Simultaneous introduction of 4-methionine sulfoxide and 8-D-lysine, in combination with 9-phenylalanine, led to a 1000 fold increase in behavioral potency. The same substitutions induced a 1000 fold decrease in melanocyte stimulating hormone activity. Incubations of ¹⁴C labeled ACTH4-9 analogs, prepared by reductive methylation, were carried out with plasma and brain extracts. The concentrations of nonmetabolized hexapeptides, which appear to be responsible for behavioral activity, were determined as a function of incubation time. The in vitro half life of intact hexapeptides correlated with their behavioral activity. It is concluded that the increase in behavioral potency as a result of amino acid substitutions can be explained in part by increased resistance against biotransformation. 21 references. (Author abstract modified)

246855 Hoffmeister, Friedrich; Wuttke, Wolfgang. Vorstand des Instituts für Pharmakologie der BAYER AG, D-5600 Wuppertal 1, Postfach 130105, West Germany **Further studies on self-administration of antipyretic analgesics and combinations of antipyretic analgesics with codeine in rhesus monkeys.** Journal of Pharmacology and Experimental Therapeutics. 193(3):870-875, 1975.

The possible reinforcing effect of acetylsalicylic acid (ASA) was studied in a group of rhesus monkeys that had no history of self-administration of drugs. Rates of lever pressing were compared under conditions in which each lever-pressing response resulted in an infusion of saline, an infusion of saline plus delivery of a food pellet or an infusion of ASA (0.4, 1.0, 2.5 or 5.0 mg/kg/infusion). Responding was engendered and maintained by the delivery of food pellets but not by infusions of saline alone nor by ASA; however, responding was subsequently engendered and maintained in these monkeys by codeine (0.05 mg/kg/infusion). In another group of monkeys that had been trained to respond under a 10 response fixed ratio schedule of i.v. infusions of codeine, the possible reinforcing effects of aminophenazone, phenylbutazone and of combinations of each of these drugs with codeine were studied. Aminophenazone and phenylbutazone (0.4 to 5.0 mg/kg/infusion) did not maintain responding previously engendered by codeine. Mixtures of aminophenazone and phenylbutazone with codeine decreased the number of codeine self-administrations. Thus, codeine intake was reduced when aminophenazone and phenylbutazone were added to codeine in the solution to be self-administered. It is concluded that antipyretic analgesics are not effective in reinforcing behavior in the rhesus monkey. 4 references. (Author abstract)

246967 Dubinsky, B.; Kinnard, W. J., Jr.; Buckley, J. P. Dept. of Pharmacodynamics, Warner-Lambert Research Inst., Morris Plains, NJ 07950 Effects of selected drugs on an auditory or thalamic conditioned stimulus eliciting recruitment in the cat. *Journal of Pharmaceutical Sciences*. 64(10):1647-1651, 1975.

Minimally effective oral doses of chlorpromazine, imipramine, and pentobarbital necessary to block a discrete trial conditioned avoidance response were compared in cats chronically implanted with electrodes over the cerebral cortex and in the nucleus centralis medialis of the thalamus. Three conditioned stimulus contingencies consisting of tone and low or high voltage thalamic stimulation were presented. It was found that minimal conditioned response blocking doses of these agents produced only slight qualitative changes in cortically recorded recruitment. Drug treatment affected the conditioned stimulus contingencies differentially, and the rank order in terms of ease of disruption of the conditioned avoidance response was high voltage thalamic conditioned stimulus, low voltage thalamic conditioned stimulus, auditory conditioned stimulus. It is suggested that the differential effect of these drugs might have been due to the additive inhibition of these agents and the thalamic conditioned stimulus on performance. With the exception of chlorpromazine, the behavioral effects of these drugs and their effects on recruitment were dissociated. 21 references. (Author abstract)

247151 Le Clec'h, G.; Patay, M.; Van Den Driessche, J. Laboratoire de Pharmacologie du C.H.U. de Rennes, avenue Professeur Leon-Bernard, 35043 Rennes, France /Fluphenazine: difficulties and limitations in animal experimentation with neuroleptic substances./ A propos de la fluphenazine, difficultes et limites de l' experimentation animale en matiere de neuroleptiques. *Revue de Neuropsychiatrie de l'Ouest (Rennes)*. 12(48):25-35, 1975.

The difficulties encountered in research with fluphenazine are discussed, particularly the data interpretation problem in human experimentation due to confusing psychological effects, and numerous methodological problems in animal research. In a study designed to eliminate the majority of the problems of animal experimentation, several animal species (mouse, rat, dog) were given the fluphenazine (Moditen), alone or with the

trihexyphenidyl (Artane), over an eight week period to determine the mechanism of action of this neuroleptic, and in particular to separate long-term effects from immediate ones. A clear tolerance of fluphenazine was observed in all tests except amphetamine stereotypes and avoidance conditioning. Trihexyphenidyl counteracted the effects of fluphenazine, both short-term and long-term, in all tests except traction and turning rod. It is noted that the effects of neuroleptics on animals seem to contradict those noted in humans, where no long-term diminution of therapeutic effects has been observed. Further study of the pharmacological role of neuroleptics on the limbic system is recommended. 4 references.

247206 Smee, M. L.; Weston, P. F.; Skinner, D.; Day, T. Smee, M. L.; Weston, P. F.; Skinner, D.; Day, T. Biological Sciences, Bedford Park, South Australia 5042 Australia Dose-related effects of central noradrenaline stimulation on behavioural arousal in rats. *Psychopharmacology Communications*. 1(2):123-130, 1975.

The general activity of rats in an open field test situation was observed following the central administration of isotonic saline and 0.5 and 2.0 micrograms of noradrenaline into the locus coeruleus. A significant increase in activity was found following the 0.5 microgram but not the 2.0 microgram dose. It is noted that these results are consistent with other reports indicating that low doses of centrally administered noradrenaline produce behavioral arousal whereas higher doses result in behavioral depression. In addition, it is felt these findings suggest that the noradrenergic neurons arising from the locus coeruleus may be important for the arousal status of rats. 10 references. (Author abstract)

247207 Norton, Stata; Culver, Bruce; Mullenix, Phyllis. University of Kansas Medical Center, Kansas City, KS 66103 Measurement of the effects of drugs on activity of permanent groups of rats. *Psychopharmacology Communications*. 1(2):131-138, 1975.

An experiment designed to discover if grouped animals, as opposed to isolates, have a more toxic reaction to psychoactive drugs, and if prolonged grouping causes the development of social behavior which further affects drug reactions is described. Morphine and amphetamine induced changes in the circadian activity cycles of rats in a residential maze were observed. It was found that low doses of both drugs produced marked changes during the diurnal cycle but produced little change during the nocturnal period. It is concluded that maintaining rats in a spatially structured environment tends to structure the behavior in a way appropriate to the space available and that this tends to stabilize the activity recorded in any portion of the environment. 8 references.

247209 Overstreet, D. H.; Schiller, G. D.; Biggins, J. G.; Crane, G. School of Biological Sciences, The Flinders University of South Australia, Bedford Park, South Australia 5042, Australia Diapogenic effects of intra and extracellular thirst stimuli before and after chronic DFP treatment. *Psychopharmacology Communications*. 1(2):157-164, 1975.

A study of the diogenic effects of intra and extracellular thirst stimuli before and after chronic diisopropyl fluorophosphate (DFP) treatment is reported. The water intake of rats was observed following subcutaneous administration of intracellular and extracellular thirst stimuli (hypertonic saline, polyethylene glycol, angiotensin, and isoproterenol) before and after chronic treatment with the anticholinesterase agent, diisopropyl fluorophosphate (DFP) and its arachis oil vehicle. It was found that only hypertonic saline and isoproterenol re-

liably increased water intake into both groups prior to chronic treatment. It was also found that after chronic treatment hypertonic saline produced the same degree of water intake in the DFP treated and control animals, but isoproterenol appeared to produce a greater degree of water intake in the DFP treated than in the control rats. It is concluded that there are no gross disturbances in the mechanisms underlying intracellular and extracellular thirst stimuli following the development of tolerance to DFP. 10 references. (Author abstract modified)

247420 Pihl, Robert; Shore, Howard. McGill Univ., Montreal, Canada **Arousal and activity level of rats with lesions in the dorsal hippocampus. Perceptual and Motor Skills.** 41(3):815-820, 1975.

The effect on gross locomotor activity of irrelevant stimuli, prior exposure to these stimuli, and two dosages of amphetamine, were assessed on rats with lesions in the dorsal hippocampus. These animals were significantly more active postoperatively than sham lesioned subjects. Prior exposure to the irrelevant stimuli increased postoperative differentiation between stimuli, whereas the introduction of amphetamine had the reverse effect. Changes in locomotor activity occurred at lower dosages of amphetamine than in previous studies, suggesting that the irrelevant stimuli have an arousal effect which acts additively with amphetamine and hippocampal impairment. 10 references. (Author abstract)

247485 Massotti, M.; De Carolis, A. Scotti; Longo, V. G. Laboratori di Chimica Terapeutica, Istituto Superiore di Sanita, Roma, Italy **Effects of trazodone on behavior and brain amine content of mice. Current Therapeutic Research.** 19(1):133-139, 1975.

In a study of the effects of trazodone on brain metabolism, an increase in brain serotonin (5-HT) produced in mice by an injection of 5-hydroxytryptophan (5-HTP) was potentiated by a prior administration of pargyline (20mg/kg i.p.) plus trazodone (2mg/kg i.p.) but not by either of the two drugs alone. The pargyline plus trazodone pretreatment enhanced also the level of brain dopamine but not norepinephrine. A significant increase in the norepinephrine level was obtained, however, in mice treated with trazodone alone (i.e. not followed by 5-HTP), whereas the pargyline/trazodone combination alone had no effect on any of the three amines studied. Behavioral changes produced by pargyline plus 5-HTP were intensified by trazodone. 7 references. (Author abstract modified)

247683 Klawans, Harold L.; Margolin, David I.; Dana, Nava; Crosset, Pamela. Division of Neurology, Michael Reese Hospital and Medical Center, Department of Medicine, University of Chicago, Chicago, IL **Supersensitivity to d-amphetamine- and apomorphine-induced stereotyped behavior induced by chronic d-amphetamine administration. Journal of the Neurological Sciences (Amsterdam).** 25(3):283-289, 1975.

In an examination of the converse of denervation hypersensitivity, supersensitivity following the chronic stimulation of specific receptor sites is reported in guinea pigs which exhibited increased sensitivity to both d-amphetamine and apomorphine-induced stereotyped behavior following chronic pretreatment with d-amphetamine. This chronic agonist or innervation supersensitivity is believed to be a reflection of an increased sensitivity of dopamine receptor sites within the corpus striatum to dopaminergic agonists. It is suggested that the appearance of dyskinetic movement disorders in humans following the chronic use of levodopa or amphetamine may be a manifestation of similarly increased dopamine receptor site sensitivity within the striatum. It is suggested that the animal

model of innervation supersensitivity may be useful in the investigation of these human movement disorders. 19 references. (Author abstract modified)

247845 McMillan, D. E. Department of Pharmacology, School of Medicine, University of North Carolina, Chapel Hill, NC 27514 **Drugs and punished responding VI: body weight as a determinant of drug effects. Research Communications in Chemical Pathology and Pharmacology.** 13(1):1-7, 1976.

In a study of the effect of food deprivation in punished responding manipulated through drugs, pigeons were rewarded with grain for pecking a key under a fixed interval schedule of food presentation. After responding stabilized, each key peck produced a 3.5mA electric shock, about 50msec in duration. Dose effect curves for pentobarbital, d-amphetamine and chlordiazepoxide on punished responding were determined in these pigeons when their bodyweights were adjusted to 70%, 90% or 100% of their free feeding weights. The lower the bodyweight, the higher the rate of punished responding before drugs were given. Pentobarbital increased punished responding at all three bodyweights, but it produced the largest increases in punished responding over the widest dose range when the bodyweight was maintained at 90% of the free feeding weight. Chlordiazepoxide also tended to produce rate increases at all three bodyweights, but d-amphetamine increased the rate only when the birds were maintained at 100% of their free feeding weights. It is concluded that while food deprivation does have an effect, the degree of influence depends on the drug used in the punished responding task. 9 references. (Author abstract modified)

247863 Stewart, Warren J. Department of Psychology, La Trobe University, Bundoora, Victoria, Australia, 3083 **The effect of scopolamine on the stimulus change phenomenon. Life Sciences (Oxford).** 17(11):1733-1736, 1975.

In an effort to identify the source of inconsistent results obtained in previous research on attenuation of habituation by scopolamine, dose response information was collected in a situation involving habituation to novel stimuli in the absence of the emission of an overt response. Saline treated rats chose a novel stimulus, whereas rats injected with scopolamine showed no preference for a novel or familiar stimulus. Scopolamine decreased the latency to approach the stimulus. It is concluded that the effects of procedural and test situation variables and drug induced interfering behaviors must be considered in the assessment of drug induced effects on reactions to novelty. 14 references. (Author abstract modified)

247875 Andersen, Henning; Braestrup, Claus; Randrup, Axel. Psychopharmacological Research Laboratory, Dept. F, Set. Hans Mental Hospital, DK-4000 Roskilde, Denmark **Apomorphine-induced stereotyped biting in the tortoise in relation to dopaminergic mechanisms. Brain, Behavior and Evolution (Basel).** 11(5-6):365-373, 1975.

A biting behavior observed in the Moroccan pond tortoise (*Clemmys Caspica* Leprosa) after apomorphine administration is described. The biting behavior was antagonized by the specific antidopaminergic drug haloperidol (10mg/kg) and trifluoperazine (15mg/kg). The behavior was compared to similar behaviors in birds and mammals. The dopamine metabolites, homovanillic acid and 3,4-dihydroxyphenylacetic acid, were measured by a gas chromatographic method in the tortoise brain. From the effects on behavior and the changes in the level of these metabolites upon drug administration, it is concluded that the dopamine system in the tortoise is qualitatively similar to that in birds and mammals but less sensitive to blockade. 35 references. (Author abstract)

247889 Moran, Elaine C.; McKinney, William T., Jr. Primate Laboratory, University of Wisconsin Medical School, Madison, WI 53706 Effects of chlorpromazine on the vertical chamber syndrome in rhesus monkeys. *Archives of General Psychiatry*. 32(11):1409-1413, 1975.

In an attempt at social rehabilitation, chlorpromazine was given to three groups of rhesus monkeys that had been confined to the vertical chamber apparatus early in their development. Previous studies have shown that such periods of deprivation produce severe deficits in social behavior. Results show no substantial beneficial effects of chlorpromazine treatment; however, there was a notable amount of spontaneous improvement seen in all three groups. Data are discussed in terms of their implications for the use of the vertical chamber as a tool in experimental research of psychopathological disorder. 19 references. (Journal abstract)

248008 Gotsick, James E.; Drew, W. G.; Proctor, Donna L. Department of Psychology, Morehead State University, Morehead, KY 40351 Apomorphine-induced aggression: an evaluation of possible sensitizing factors in the rat. *Pharmacology (Basel)*. 13(5):385-390, 1975.

The effects of prior experience with fighting and prior experience with both apomorphine and fighting are evaluated as possible sensitizing factors in rat intraspecific aggression induced by apomorphine. Results reveal that prior experience with the drug alone, or with fighting alone, has no effect on apomorphine induced aggression. However, animals that have previously fought under the influence of apomorphine show even higher levels of aggression, suggesting that repeated experience with both the drug and fighting induces a type of sensitization. 13 references. (Author abstract)

248223 Signoret, Jean-Pierre. I.N.R.A. Station de Physiologie de la Reproduction, Nouzilly, 37380 France Effects of oestrogen and androgen on the sexual behaviour of the ovariectomized ewe. *Psychoneuroendocrinology*. 1(2):179-184, 1975.

Twelve ovariectomized Ile de France ewes were injected either with 50 micrograms of estradiol benzoate or 10mg of testosterone propionate 48 hr after the last of five daily injections of 25mg of progesterone. In both cases the experimental females exhibited normal female sexual behavior. In a second experiment, the ewes were injected daily for 4 weeks either with 50 micrograms of estradiol benzoate or with 10mg of testosterone propionate. In both cases male patterns of sexual behavior appeared, but more intensely with androgen than with estrogen, and simultaneously, the ewes became receptive. However, receptivity declined rapidly after a few days of estrogen treatment, but not with androgen. 11 reference. (Author abstract)

248289 Dolphin, Annette; Jenner, Peter; Marsden, C. David. University Department of Neurology, Denmark Hill, London S.E.5, England Modification of the L-Dopa reversal of reserpine akinesia by inhibitors of dopamine-beta-hydroxylase. *European Journal of Pharmacology (Amsterdam)*. 35(1):135-144, 1976.

The effect of the dopamine-beta-hydroxylase inhibitors (DBHI) FLA-63 and U10,157 on the reversal of reserpine akinesia by L-Dopa in mice is investigated both behaviorally and by measurement of the cerebral amines dopamine and noradrenaline. Pretreatment of reserpinized animals with intraperitoneal, but not oral, FLA-63 produced hypermotility in the first hour after L-Dopa administration, compared to animals receiving L-Dopa alone. This enhanced activity was associated with an increase in dopamine, but no significant

change in the noradrenaline content of whole brain. Pretreatment with both oral and intraperitoneal FLA-63 caused dose dependent suppression of locomotor activity in the second and third hours after L-Dopa. This suppression was associated with a significant decrease in brain noradrenaline in the presence of a significant elevation in brain dopamine. Pretreatment of animals with U10,157 produced similar but less marked behavioral responses. The results do not appear to be due to stressful effects of DBHI's, causing release of corticosteroids; neither corticosterone nor beta-methasone had any significant effect on L-Dopa induced locomotor activity in reserpinized animals, although they did increase spontaneous motor activity in normal animals. The data presented support the concept that both noradrenaline and dopamine are responsible for the gross motor activity induced by L-Dopa in the reserpinized mouse. 37 references. (Author abstract)

248394 Gay, Patricia E.; Potter, Larry S.; Cole, Sherwood O. Department of Psychology, Rutgers University, Camden, NJ 08102 Interacting effects of amygdala lesions with chlordiazepoxide and pilocarpine on mouse killing by rats. *Bulletin of the Psychonomic Society*. 7(1):69-71, 1976.

A study of the interacting effects of amygdala lesions with chlordiazepoxide and pilocarpine on mouse killing by rats is reported. Following lesions of the amygdala, rats previously responsive to the killing initiating effects of chlordiazepoxide (7.5mg/kg) either continued to kill when drugged or demonstrated a complete block of the mouse killing response. These responses to the drug appear related to the site and extent of lesion damage. However, daily injections of pilocarpine (7.5mg/kg), administered beginning on postsurgical day 19, initiated killing in most of the amygdala lesioned rats. Possible interpretations of this finding are discussed. 8 references. (Author abstract modified)

248407 Costall, Brenda; Naylor, Robert J. Postgraduate School of Studies in Pharmacology, University of Bradford, Bradford, England Neuroleptic antagonism of dyskinetic phenomena. *European Journal of Pharmacology (Amsterdam)*. 33(2):301-312, 1975.

An investigation of neuroleptic antagonism of dyskinetic phenomena is reported. The bilateral intrastratial administration of dopamine to guinea pigs pretreated with nialamide induced dyskinesias and a hyperactive state. Hyperactivity was inhibited by the peripheral administration of large doses of several different neuroleptic agents, e.g. haloperidol and fluphenazine, but only pimozide and oxiperomide inhibited the other forms of dyskinetic movements. The specificity of the antidyskinetic abilities of oxiperomide and pimozide was emphasized by the inactivity of a large number of typical neuroleptics, atypical neuroleptics, motor depressant agents, adrenergic blocking agents, and dopaminergic agonists. Apomorphine was shown to reduce the intensity of the dyskinetic phenomena but the dosage was found to be critical. Results are interpreted in terms of two neostriatal dopaminergic mechanisms and discussed in relationship to clinical dyskinesias. 36 references. (Author abstract modified)

248437 Morrison, Helen L.; Kraemer, Gary W.; McKinney, William T. University of Wisconsin, Madison, WI 53706 Protest-despair response to peer separation in rhesus monkeys and its potentiation by alteration of catecholamine metabolism. *Psychosomatic Medicine*. 38(1):66, 1976.

At the Annual Meeting of the American Psychosomatic Society, Pittsburgh, March 1976, a study designed to test the possibility that the peer separation response in rhesus mon-

keys could be potentiated by the use of a known blocker of catecholamine synthesis was reported. Four rhesus monkeys, 18 months of age and reared in a stable peer group, were subjected to together living conditions versus separation conditions in 1 week blocks while receiving either placebo or varying doses of alpha-methyl-p-tyrosine (AMPT). Analysis of variance was performed to compare these conditions and their effects on behavior. Results indicate that AMPT potentiates the protest despair response to separation in a dose related fashion. It is concluded that 1) a drug such as AMPT can have quite different behavioral effects depending on the social setting in which it is given; and 2) the protest despair response to peer separation can be significantly enhanced by a drug (AMPT) which blocks catecholamine synthesis. Implications for research into the etiological factors in human affective disorders are pointed out. (Author abstract modified)

248514 Marcy, R.; Quermonne, M. A.; Nammathao, B. University of Caen, 1, rue Vaubenaud, F-14032 Caden-Cedex, France. *Habituation to iterative photostimulation in the palmar skin conductance response of mice, its delay by psychoanaleptics*. *Experientia* (London). 32(2):208-209, 1976.

The phenomenon of habituation is observed in mice using a palmar skin conductance response (PSCR) test. Effects of analeptic drugs upon this process are analyzed. It was observed that iterative photostimulation resulted in habituation, detected in the palmar skin response, but that psychoanaleptic drugs (amphetamine, dexamphetamine, caffeine, and pyrisucideanol dinal) delayed the habituation response in proportion to the dose administered. 10 references. (Author abstract modified)

248956 Edelson, Albert; Gottesfeld, Zehava; Samuel, David; Yuwiler, Arthur. Isotope Department, Weizmann Institute of Science, Rehovot, Israel. *Effect of lithium and other alkali metals on brain chemistry and behavior: II. Intracranial self-stimulation behavior*. *Psychopharmacologia* (Berlin). 45(3):233-237, 1976.

The intracranial self-stimulation (ICSS) behavior of rats receiving repeated treatments of low doses of lithium, rubidium and other alkali metals was studied to test the assumption that lithium and rubidium may have antagonistic effects in emotional behavior. Rats implanted with bipolar electrodes aimed at the medial forebrain bundle (MFB) were trained to self-stimulate. Six daily injections of 2mEq/kg of the chloride salts of Li⁺, Rb⁺ or Cs⁺ were administered, and the rate of ICSS was recorded. It was found that lithium caused a reversible decrease in ICSS rate, beginning on the second day and returning to pretreatment rate on the fourth day of injections. The decrease was more pronounced in animals with high baseline rate than in low responders. Rubidium enhanced ICSS rate whereas cesium had no effect. It is noted that although these results agree with other accumulating data showing the opposite effects of Li⁺ and Rb⁺, their relevance to affective disorders is not clear. 26 references. (Author abstract modified)

248959 Babbini, M.; Gaiardi, M.; Bartoletti, M. Instituto di Farmacologia dell'Universita di Bologna, Via Irnerio 48, I-40126 Bologna, Italy. *Changes in fixed-interval behavior during chronic morphine treatment and morphine abstinence in rats*. *Psychopharmacologia* (Berlin). 45(3):255-259, 1976.

An investigation of changes in fixed-interval behavior during chronic morphine treatment and morphine abstinence in rats is reported. Rats previously trained to a fixed-interval schedule (FI 2 min) were treated twice daily with saline or morphine

hydrochloride (final dose 40mg/kg i.p.) for 44 days. On day 45 an abstinence state was induced by withdrawing morphine or by giving nalorphine (1mg/kg i.p.). Operant behavior was recorded on alternative days during the period of chronic treatment and during the withdrawal phase (21 days). It was found that the number of lever presses decreased significantly during the first days of morphine administration but increased later over the control values. The quarter life was not changed during this period. Morphine withdrawal and nalorphine treatment both caused a further increase in lever presses that lasted about 11 days. Again quarter life was not changed. Results indicate that the effects of morphine on FI behavior in rats not only undergo tolerance but are actually reversed during the chronic treatment. The data obtained during the withdrawal phase are discussed in relation to the secondary abstinence syndrome described by Martin (1963). 27 references. (Author abstract modified)

248963 Torrelío, Marina; Izquierdo, Juan A. Farmacologia Experimental, Fac. Farmacia y Bioquímica, Buenos Aires, Argentina. *Pre-trial cocaine and performance in rat*. *Psychopharmacologia* (Berlin). 45(3):283-285, 1976.

A study of the effect of cocaine on performance and retention of a conditioned avoidance response in the rat is reported. It was found that cocaine injected pretrial (10mg/kg i.p.) improves performance in naive and high performance and low performance trained rats. When the effect of cocaine is removed, the number of conditioned responses decreases and equals that of drugless sessions. It is suggested that cocaine favors only performance, not retention. 7 references. (Author abstract modified)

248964 Stinus, L.; Thierry, A. M.; Cardo, B. Laboratoire de Psychophysiologie, Institut de Biologie Animale, Université de Bordeaux I, Avenue des Facultés, F-33405 Talence, France. *Effects of various inhibitors of tyrosine hydroxylase and dopamine beta-hydroxylase on rat self-stimulation after reserpine treatment*. *Psychopharmacologia* (Berlin). 45(3):287-294, 1976.

The behavioral effects of low doses of the catecholamine (CA) synthesis inhibitor, alpha-methyl-p-tyrosine (alpha-MPT, 50mg/kg i.p.), or the norepinephrine (NE) synthesis inhibitors (FLA-63, 15mg/kg i.p., U-14624, 50mg/kg i.p., or disulfiram, 150mg/kg i.p.) were studied in rats pretreated with reserpine (1mg/kg i.p.) 24 hours before. Rats were implanted either in the area ventralis tegmenti (AVT) or in the lateral hypothalamus (LH). The modifications of CA synthesis and endogenous CA levels were estimated in a parallel experiment. Reserpine treatment produced a slow decrease in self-stimulation (SS) rates during the first 12 hours; SS rates were 85% of control values 24 hours after reserpine treatment. Injection of alpha-MPT in reserpine pretreated rats inhibited SS (85% decrease 3 hours after administration either in AVT or LH rats), whereas dopamine beta-hydroxylase inhibition had no great effect on SS. The administration of very low doses of alpha-MPT (20mg/kg i.p.) to rats treated with reserpine (24 hours before) plus FLA-63 (1 hour before) induced an important decrease in SS rates in AVT implanted rats only. The major conclusion is that dopaminergic neurons seem to be involved in AVT and LH self-stimulation. It is observed that the last experiment suggests the involvement of a balance between dopaminergic and noradrenergic neurons in AVT self-stimulation. 41 references. (Author abstract modified)

249001 Hinc, Bromfield; Torrelío, Marina; Gershon, Samuel. Neuropsychopharmacology Research Unit, Department of

Psychiatry, New York University School of Medicine, New York, NY 10016 **Interactions between cannabidiol and delta9-THC during abstinence in morphine-dependent rats.** *Life Sciences (Oxford)*. 17(6):851-858, 1975.

Interactions between cannabidiol (CBD) and delta9-THC were assessed during abstinence, precipitated one hour after the last series of injections of these agents. CBD had little effect on abstinence scores, but significantly increased the abstinence attenuating properties of delta9-THC. Rotational behavior, induced by delta9-THC during abstinence, was also potentiated by CBD. It is concluded that these data extend previous reports of potentiation of pharmacological effects of THC by CBD to abstinence attenuating properties and other effects of THC in morphine dependent rats. 22 references. (Author abstract modified)

249005 Post, Robert M.; Kopanda, Richard T.; Lee, Alison. Section on Psychobiology, Adult Psychiatry Branch, National Institute of Mental Health, Bethesda, MD 20014 **Progressive behavioral changes during chronic lidocaine administration: relationship to kindling.** *Life Sciences (Oxford)*. 17(6):943-950, 1975.

Lidocaine was administered chronically (60mg/kg, i.p., 5 times weekly) to rats in order to examine its effect on seizure threshold and behavior. This regimen resulted in the progressive development of abnormal eating behavior and seizures. Experimental rats became omniphagic, eating significantly more feces, straw, and gauze than controls. Following an average of 15 lidocaine injections unassociated with seizures, animals began to have major motor convulsions, which then increased in frequency and duration. A pharmacological kindling mechanism is suggested for the progressive effects of lidocaine on behavior and seizures. 30 references. (Author abstract modified)

249025 Overton, D. A. Eastern Pennsylvania Psychiatric Institute, Philadelphia, PA 19129 **A comparison of the discriminable CNS effects of ketamine, phencyclidine and pentobarbital.** *Archives Internationales de Pharmacodynamie et de Therapie (Ghent)*. 215(2):180-189, 1975.

Studies to determine the discriminability of ketamine, phencyclidine, and pentobarbital, and to compare their discriminational effects on the central nervous system are reported. In a shock/escape T-maze task, rats were required to learn drug discriminations involving doses of pentobarbital, phencyclidine and ketamine. Linear dose effect curves relating discriminability (sessions to criterion) to dosage were obtained with all three drugs. Phencyclidine and ketamine produced much more response randomization than did pentobarbital at doses matched for discriminability. Phencyclidine and ketamine tended to mimic each other's discriminable effects, but neither mimicked or was mimicked by pentobarbital. Drug vs drug training demonstrated that phencyclidine and ketamine differed discriminably from each other. It is noted that the response disorganization observed in the T-maze is congruent with the cognitive disorganization that is clinically observed, and this suggests that learning may be more difficult to obtain with dissociative anesthetics than with barbiturates. 9 references. (Author abstract modified)

249026 Sansone, M. Laboratorio di Psicobiologia e Psicofarmacologia, C.N.R., 1 via Reno, 00198 Roma, Italy **Effects of chlordiazepoxide, CNS stimulants and their combinations on avoidance behaviour in mice.** *Archives Internationales de Pharmacodynamie et de Therapie (Ghent)*. 215(2):190-196, 1975.

Various central stimulant drugs were tested alone or in combination with chlordiazepoxide in mice subjected to five daily 100 trial avoidance sessions in the shuttlebox. Facilitation of avoidance responding was observed following i.p. administration of methamphetamine and cocaine, but not following methylphenidate, caffeine, penitrazole and strychnine. Some favorable effects were obtained by combining the above stimulant drugs with chlordiazepoxide. Advantages in the combination with chlordiazepoxide were particularly evident in the case of methamphetamine. These two drugs, when given together, produce effects which cannot be obtained by administering them separately. 18 references. (Author abstract modified)

249032 Reinis, S. Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada **Effect of hydroxylamine on the consequences of long-lasting administration of morphine in mice: III. Effect on preferred drinking of morphine solution.** *Archives Internationales de Pharmacodynamie et de Therapie (Ghent)*. 215(2):238-245, 1975.

Evidence that the previously observed effect of hydroxylamine on morphine tolerance and dependence is at least partly specific and holds true at the very least for some of the known morphine effects is presented. C57BL/6J mice were periodically required to drink a morphine solution for 1, 10, or 16 weeks and then injected intracranially with the mutagens hydroxylamine or sodium nitrite. Whereas before the injection of the drugs the mice demonstrated a definite preference for morphine, after hydroxylamine this preference disappeared. Sodium nitrite had no such effect on the consumption of morphine solution. It is felt that the occurrence of these results in a free choice situation demonstrates that the decreased motor activity of hydroxylamine injected mice probably does not substantially contribute to the interference with morphine dependence. 4 references. (Author abstract modified)

249076 Pycock, C. J.; Donaldson, I. MacG.; Marsden, C. D. Department of Neurology, King's College, London, S. E. 5, England **Circling behaviour produced by unilateral lesions in the region of the locus coeruleus in rats.** *Brain Research (Amsterdam)*. 97(2):317-329, 1975.

To determine whether noradrenergic influence on motor activity is mediated via the striatum, the effects of unilateral destruction of the locus coeruleus, a major source of ascending noradrenergic pathways, on motor behavior in rats were examined. Rats with unilateral lesions in the region of the locus coeruleus circled tightly to the opposite side when given apomorphine or amphetamine. This turning behavior was transient and disappeared within some 30 days after surgery. It was seen most obviously in animals with severe unilateral destruction of the locus coeruleus, which caused on average a 55% reduction in the level of noradrenaline in the ipsilateral cerebral cortex. It was not marked in animals with partial unilateral lesions of the locus coeruleus, which caused only an average fall in cortical noradrenaline of 22%. It was not seen in sham operated animals or animals in which lesions were placed into adjacent structures such as the cerebellum above superior cerebellar peduncle laterally, and brainstem ventrally. It is proposed that the mechanism of the phenomenon may be explained by the observation that dopamine in the ipsilateral striatum was increased 5 days after operation, when circling occurred, but had returned to normal by 30 days when circling had ceased. It is suggested that the lesion causes a reduction in impulse traffic in the ipsilateral nigrostriatal pathway, and that circling is due to preferential stimulation of the ipsilateral striatal dopamine receptors by both drugs; apomorphine

directly, amphetamine by release of endogenous dopamine. 37 references. (Author abstract modified)

249138 Pert, Agu; Hulsebus, Robert. Biomedical Laboratory, Edgewood Arsenal, APG, MD 21010 **Effect of morphine on intracranial self-stimulation behavior following brain amine depletion.** Life Sciences (Oxford). 17(1):19-20, 1975.

In an investigation of the role of brain amines in morphine induced intracranial self-stimulation (ICSS), morphine sulfate was found to facilitate ICSS in rats 3hrs after administration. Pretreatment with alpha-methyl-para-tyrosine reversed this facilitation whereas parachlorophenylalanine was ineffective in modifying the actions of morphine. Results indicate that facilitation of ICSS induced by morphine is due to an activation of the CA circuits which are known to mediate such behavior. It is suggested that activation of the ICSS circuits by morphine may be the cause of the drug seeking properties of the compound. 5 references. (Author abstract modified)

249139 Lal, Harbans; Gianutsos, Gerald; Puri, Surendra K. Department of Pharmacology and Toxicology, University of Rhode Island, Kingston, RI 02881 **A comparison of narcotic analgesics with neuroleptics on behavioral measures of dopaminergic activity.** Life Sciences (Oxford). 17(1):29-34, 1975.

To evaluate the role of dopamine receptors in narcotic action and narcotic dependence, various actions of haloperidol or other neuroleptics were compared with morphine or other narcotic analgesics using an indirect test procedure for ascertaining involvement of brain neurotransmitters in the action of the drugs. Acute actions compared include catalepsy, jumping, stereotypy and vomiting, and aggression; chronic actions compared include tolerance to cataleptic action and withdrawal signs. Results show that both haloperidol and morphine increase dopamine turnover in caudate, nucleus accumbens, and olfactory tuberculum, suggesting that morphine also causes dopamine receptor blockade. However, evidence from previous research is noted to indicate that haloperidol and morphine do not act at the same site. It is concluded that whereas blockade of dopamine receptors by haloperidol is by direct interaction with receptors, the blockade of the same receptors by narcotics is indirect, possibly occurring through transsynaptic mechanisms by which input into the dopaminergic systems is reduced. 12 references.

249158 Kay, Edwin J. Lehigh University, Bethlehem, PA 18015 **Aversive effects of repeated injections of THC in rats.** Psychological Reports. 37(3):1051-1054, 1975.

In a study of the aversive effects of multiple injections of tetrahydrocannabinol (THC), exposure of rats to a novel substance (.1% sodium saccharin) was paired with 0, .25, .5, 1.0, 2.0, and 4.0mg/kg of delta 9-THC for 1, 6 or 12 days. In a subsequent test, all groups showed a decreased preference for saccharin as the dosage of THC was increased. Results indicate that THC is aversive in multiple as well as single injections and are consistent with previous research. 4 references. (Author abstract modified)

249246 Carney, J. M.; Woods, J. H.; Carney, P. A. University of Michigan Medical School, Ann Arbor, MI 48104 **Ketocyclazocine: behavioral effects in pigeons and monkeys.** Pharmacologist. 17(2):187, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented

examining the effects of ketocyclazocine on the behavior of pigeons and monkeys. In pigeons, ketocyclazocine is one tenth as potent as cyclazocine in decreasing the rate of food reinforced responding (multiple FR 30, FI 5 min schedule). Naloxone has little if any ability to reverse this ketocyclazocine effect in pigeons. In monkeys, ketocyclazocine and cyclazocine are equipotent in decreasing food reinforced responding (FR 30); naloxone reverses this effect in the monkey, although the naloxone dose required is larger than that needed to antagonize morphine effects. Neither ketocyclazocine nor cyclazocine is self-administered by rhesus monkeys who will self-administer pentazocine. Morphine dependent monkeys (who have been receiving 3.2mg/kg of morphine i.m. every 8 hours for several months) are more sensitive than normal monkeys to the rate - decreasing effects of ketocyclazocine (x10 - 30), cyclazocine (x100 - 300), or naloxone (3000 - 10000). (Author abstract modified)

249247 Gellert, V.; Sparber, S. B. University of Minnesota, Minneapolis, MN 55455 **Further studies on the sensitivity of operant behavior to detect opiate withdrawal in rats.** Pharmacologist. 17(2):187, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics held in August 1975 at the University of California, Davis, a study examining the dose response and time response relationships to naloxone precipitated morphine withdrawal in relation to rat's fixed ratio operant behavior was presented. Disruption of fixed ratio (FR) operant behavior is well correlated with bodyweight loss in rats implanted with a single morphine (M, 75mg) pellet and injected intermittently with naloxone (Nx) over a 3 to 4 week period. Since the shortest time interval of FR behavior sampled started 0.5hr after various doses of Nx 0.1to 1.0mg/kg i.p. begun immediately after i.p. injections of lower dose of the antagonist (0.01 to 0.10mg/kg). Additionally, bodyweight comparisons were made by contrasting the actual weight after Nx with predicted weights derived from control sessions. While 10mg and 25mg Nx/kg produced a dose related significant reduction in FR behavior in drug naive rats, 1.0mg Nx/kg had no effect. Likewise, 0.01mg Nx/kg, in animals implanted with M approximately 3 days earlier, did not result in changes in FR behavior. Significant dose dependent reductions in FR responding were produced by 0.03mg and 0.10mg Nx/kg within 5 min of the injections. Only the higher dose (0.10mg/kg) was found to cause a significant reduction in bodyweight. (Author abstract modified)

249253 Watanabe, K.; Iwata, H.; Hiroi, J.; West, W. L. Howard University College of Medicine, Washington, DC 20059 **The incidence of self-mutilation in morphine tolerant Sprague-Dawley male rats.** Pharmacologist. 17(2):189, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study examining the incidence of self-mutilating behavior in morphine tolerant rats was presented. Lesch-Nyhan syndrome is the X-linked familial neurological and behavioral disorder associated with excessive production of uric acid. Tolerance to morphine was produced in each rat by the subcutaneous injection of increasing dosages of morphine (20, 60, 150, 300mg/kg) twice a day for 20 days. The dosage was increased every five days. During the morphine administration, 1 to 3 out of 10 experimental rats were found to show the self-mutilation behavior at the morphine schedule dose of 60 to 150mg/kg. This phenomenon was observed in the rats kept in individual or metabolic cages. The urinary excretions of the uric acid and allantoin (mg/body/day)

increased more than 50% as the dose of morphine was increased to 150 to 300mg/kg. Food intake did not differ between groups, but water intake was about 75% greater in morphine tolerant rats. Urinary excretion of copper did not show a difference between groups, but fecal excretion of copper was diminished in morphine tolerant rats. The increase in uric acid and allantoin in urine of morphine tolerant rats suggest that chronic morphine administration suppressed the hypoxanthine-guanine (adenine) phosphoribosyl transferase or caused the overproduction of purines. (Author abstract modified)

249261 Siemens, A. J.; Chan, A. W. K. Research Institute on Alcoholism, Buffalo, NY 14203 Effects of pentobarbital in mice selectively bred for different sensitivities to ethanol. *Pharmacologist*. 17(2):197, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented which examined the effects of pentobarbital in mice selectively bred for different sensitivities to ethanol. In agreement with a previous report "short-sleep" (SS) mice showed a loss of righting reflex (RR) for a significantly shorter period of time than "long-sleep" (LS) mice following ethanol, 20% w/v in 0.9% NaCl, 4g/kg intraperitoneally (i.p.). Ethanol disappeared from the blood in the two strains of mice at apparently the same rate. Pentobarbital sodium (PB), 0.25% w/v in 0.9% NaCl, 50mg/kg i.p., produced a significantly longer loss of RR in SS than in LS mice. The PB concentration in the brain at the time of regaining the RR was found to be almost identical in both strains of mice suggesting equal sensitivities of the central nervous systems to PB. Another experiment demonstrated that the rates of disappearance of unchanged PB from the blood were the same in both strains but the apparent volume of distribution of PB in the LS was significantly greater than in the SS mice. Since the two strains of mice are equally sensitive to pentobarbital but not to ethanol, it is possible that the two depressants have different mechanisms of actions. (Author abstract modified)

249262 York, James L.; Winter, J. C. New York State Research Institute on Alcoholism, Buffalo, NY 14203 Discriminative stimulus properties of ethanol and barbitol. *Pharmacologist*. 17(2):198, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study detailing discriminative stimulus properties of ethanol and barbitol was presented. Evidence suggests that ethanol and some barbiturates produce similar subjective states. Similarities in the stimulus properties of ethanol and barbitol were examined by first training laboratory rats to discriminate 80mg/kg sodium barbitol (Group 1) or 660mg/kg ethanol (Group 2) from saline in a food motivated, bar-pressing task. Drug discriminations were trained by selectively reinforcing bar-presses under one condition but not under the other condition on alternate days. After the discriminations were well established, test doses of ethanol in the range 210 to 900mg/kg failed to elicit responding appropriate to the barbitol condition (Group 1). However, test doses of barbitol (60 and 80mg/kg) did elicit discriminative responding in rats originally trained with ethanol (Group 2). Rats trained with barbitol as a discriminative stimulus appear to have used as their "cue" a drug property which barbitol does not have in common with ethanol. On the other hand, rats trained with ethanol appear to have used as their "cue" a drug effect which is also produced by barbitol. Thus, the sub-

stitutability of two drugs as discriminative stimuli may depend upon the assignment of drugs to training and cross test status. (Author abstract modified)

249264 Gallaher, Edward J.; Loomis, Ted A. University of Washington, Seattle, WA 98195 The contribution of learning to the development of chronic ethanol tolerance in the rat. *Pharmacologist*. 17(2):198, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the contribution of learning to the development of chronic ethanol tolerance in rats. In recent years two behavioral tasks have been utilized to monitor the acquisition and loss of tolerance (T) to ethanol in rats. Chen developed a two - turn circular maze, and Gibbins, LeBlanc et al developed a moving belt task in which a rat must walk a narrow belt passing over a shock grid floor. T is indicated by a shift to the right of the dose response curve (DRC). Chronic T to these tasks clearly develops following repeated daily exposure to ethanol. This T is not due to increased metabolism or altered distribution, but must be attributed to some functional change within the central nervous system. Chen proposes that T develops as a result of learning to perform while intoxicated. LeBlanc feels that learning merely hastens the onset of physiological or cellular T. The present experiments attempt to differentiate between these two possibilities. Rats were first trained to perform the moving belt task. An acute DRC was obtained, followed by three practice runs per hour for five hours. The DRC was found to shift significantly to the right when measured the next day. This shift was not found when the intensive training was omitted. Additional experiments indicate a stronger correlation between practice and T than between dose and T, thus adding support to the learning hypothesis. (Author abstract modified)

249266 McMillan, D. E.; Leander, J. D.; Lucot, J. B. University of North Carolina, Chapel Hill, NC 27514 Some effects of parathion on the schedule-controlled behavior of the pigeon. *Pharmacologist*. 17(2):204, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining some of the effects of parathion on schedule controlled behavior of pigeons. Pigeons were trained to respond under a mult FR 30 FI 5 schedule of food presentation. Doses of 0.1 and 0.3mg/kg had little effect on behavior 15 min or 1 hr after injection. A dose of 0.56mg/kg decreased responding in both schedule components to about 50% of the control rate. When 0.1mg/kg was administered daily for 20 consecutive days, only small rate changes occurred. When 0.3mg/kg was administered daily for 20 consecutive days, both large increases and decreases in responding were observed under the FI component and large decreases were observed under the FR component, especially after the fourth day of administration. When administration of parathion was discontinued, increases in rates of responding under the FI component were sometimes observed for several days. The changes in rates of responding under the mult FR FI schedule, after both acute and chronic administration usually were not found to be accompanied by gross behavioral changes or signs of toxicity. (Author abstract modified)

249267 Robinson, C. A.; Harris, P. B.; Killam, K. F.; Braude, M. C. Department of Pharmacology, University of California at Davis School of Medicine, Davis, CA 95616 EEG and

behavioral effects of narcotic antagonists alone and in combination with other psychoactive drugs in morphine dependent *M. mulatta*. *Pharmacologist*. 17(2):206, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the EEG and behavioral effects of narcotic antagonists alone and in combination with other psychoactive agents in morphine dependent *M. mulatta*. EEG's were recorded from implanted epidural electrodes in *M. mulatta* dependent upon morphine. Morphine dependency was maintained with self-injection techniques on a continuous reinforcement schedule at 1.25 or 2.5mg/kg unit dosages. Serial autospectra, every 4 seconds, were calculated from EEG data in the basal condition (morphine dependency) and following the simultaneous administration of one or more other drugs. The spectral data support the behavioral data differentiating the pharmacology of cyclazocine from that of naloxone and naltrexone. These findings were only slightly modified by the simultaneous administration of secobarbital, ethanol, d-amphetamine, diazepam or diphenylhydantoin. (Author abstract modified)

249269 Blumberg, Harold; Ikeda, Clyde. Department of Pharmacology, New York Medical College, Valhalla, NY 10595. Naltrexone, morphine and cocaine interactions in mice. *Pharmacologist*. 17(2):206, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the interactions of naltrexone, morphine and cocaine in mice. In clinical narcotic blockade maintained by oral naltrexone HCL (N), postaddicts sometimes resort to the use of cocaine HCL (C). The possible drug interactions were investigated in mice. The Straub tail reaction was produced in fasted mice by morphine sulfate (M) 30mg/kg s.c. Motor hyperactivity was produced in normal mice by C 40mg/kg i.p. The C hyperactivity was not blocked by N 10mg/kg p.o. or s.c. When C was injected immediately after M(M-C), the Straub tail and hyperactivity were evident. The Straub tail was counteracted by N p.o. or s.c. before or after the M-C, but the C type of motor hyperactivity remained. Narcotic antagonist activity was evaluated with N p.o., followed in 20 min, by M.s.c. and C. i.p. The ED50 + or - s.e. values for N in Straub tail prevention were: with saline .33 + or - .05; with C 1.27 + or - .14mg/kg. It was previously reported that C potentiated M narcosis in rats; so the effect of C, 40mg/kg i.p., on the M Straub tail in mice was studied. ED 50+ or - s.e. values for M in producing the Straub tail were found to be: with saline 15.0+ or - 1.6; with C5.0+ or - .9mg/kg, again indicating potentiation of M by C. (Author abstract modified)

249270 Brocco, M. J.; Weinberger, S. B.; Killam, K. F.; Braude, M. C. Department of Pharmacology, University of California at Davis School of Medicine, Davis, CA 95616. Comparison of the effects of cocaine and amphetamine in monkeys maintained on naltrexone. *Pharmacologist*. 17(2):206, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented comparing the effects of cocaine and amphetamine in monkeys maintained on naltrexone. Four former addict *M. mulatta* were maintained on naltrexone (2.4mg/kg i.v. per day in two doses) for two weeks before interaction studies began. With both cocaine and amphetamine the dose response curves for behavioral changes were shifted to the left and the duration of

effects was markedly prolonged. Seizures were seen from 1.5mg/kg of d-amphetamine with hyperactivity at lower doses lasting for 6 to 8 hours. The effects of cocaine were prolonged to 4 to 6 hours with seizure like activity beginning at 4mg/kg. (Author abstract modified)

249272 Fielding, Stuart; Marky, Marguerite; Lal, Harbans. Research Department, Pharmaceutical Division, Ciba-Geigy Corporation, Summit, NJ 07901. Elicitation of mouse jumping by combined treatment with amphetamine and L-Dopa: blockade by known neuroleptics. *Pharmacologist*. 17(2):210, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study examining the elicitation of jumping behavior in mice by combined treatment with amphetamine and L-Dopa was presented. Antagonism of amphetamine induced stereotypy is often employed for preclinical testing of drugs with potential antipsychotic activity. While all known neuroleptics are found potent in that test, the quantitation of amphetamine stereotypy is based mainly upon subjective measures. A combined treatment with amphetamine and L-Dopa elicits an objective sign of jumping in mice. The usefulness of this response was evaluated in measuring neuroleptic activity. After d-amphetamine (4mg/kg)/L-Dopa (400mg/kg), mice jumped upward when placed individually in glass jars (median jumps, 128/60 min). Haloperidol, pimozide, chlorpromazine, thioridazine, and clozapine each blocked this jumping in a dose dependent manner. On a mg/kg basis, haloperidol and pimozide were most potent. Clozapine, which usually shows only minimal activity in most conventional tests, was equipotent with chlorpromazine in the mouse jumping test. Morphine also blocked jumping but only at high doses. Antidepressant drugs such as imipramine were found either to be inactive or actually to enhance activity. (Author abstract modified)

249274 Shuster, Louis; Short, Peter H. Tufts University School of Medicine, Boston, MA 02111. The effect of amphetamine pretreatment on the amphetamine-induced changes in motor activity and brain catecholamines in mice. *Pharmacologist*. 17(2):210, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the effect of amphetamine pretreatment on the amphetamine induced changes in motor activity and brain catecholamines in mice. B6AF1/J mice were injected twice daily for 5 days with 10mg/kg d-amphetamine-HCl(A). Three days after the last injection, these mice, and control mice pretreated with saline, were given a test dose of 5mg/kg A. The running response was 4 times greater for the A pretreated mice. Brain norepinephrine (NE) of A pretreated mice was depleted to 50% of control levels and brain dopamine (DA) to 85%. The test dose of 5mg/kg A lowered brain NE levels of control mice from .50 micrograms/g to .25 micrograms/g in 2 hours. In A pretreated mice, this injection caused an increase in brain NE from .25 micrograms to .55 micrograms/g at 30 minutes, followed by a decrease to .25 micrograms at 60 minutes. No change in brain DA levels was observed in either group. Sensitization to amphetamine running persisted for as long as 43 days after pretreatment. No cross sensitization to morphine or cocaine was observed. A twofold increase in the running response to A, 5mg/kg, was obtained 3 days after a single 5mg/kg injection of reserpine. These results suggest that the sensitization produced by amphetamine pretreatment may

be related to the depletion of brain NE. (Author abstract modified)

249275 Snell, Diane; Harris, R. A.; Loh, H. H. Department of Pharmacology, University of California, San Francisco, CA 94143 Effects of d-amphetamine, monomethoxyamphetamines and mescaline on fixed interval responding in rats. *Pharmacologist*. 17(2):210, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the effects of d-amphetamine, monomethoxyamphetamines and mescaline on fixed interval responding in rats. Rats responding on a fixed interval (FI) 2 min schedule for food reinforcement were injected s.c. with d-amphetamine (A), mescaline (Mesc), or ortho-, meta- or para-monomethoxyamphetamine (OMA, MMA, PMA). These drugs reduced the overall rates of FI responding with the relative potencies of: A is greater than PMA is greater than MMA equal to OMA is greater than Mesc. However, A, MMA and PMA increased the low rates of responding seen at the beginning of the interval and decreased the high rates of responding found at the end of the interval, while OMA and Mesc decreased responding in all segments of the interval. Ranking of these drugs on the basis of their rate dependency (i.e., the slope of the line derived by graphing log control rate vs log percent of control) gave the series A is greater than MMA is greater than PMA is greater than Mesc is equal to OMA. This ranking and other data indicate that the rate dependent effects of these drugs may be directly related to their relative effects on catecholamine systems and inversely related to their effects on serotonin systems. (Author abstract modified)

249278 Dial, E. J.; Rattan, S.; Clay, M. M. University of Houston, Houston, TX 77004 Effect of restriction of movement and beta-diethylaminoethylphenylpropylacetate/hydrochloride on sodium barbital activity in the rat. *Pharmacologist*. 17(2):211, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the effect of restriction of movement and beta-diethylaminoethylphenylpropylacetate hydrochloride on sodium barbital activity in the rat. Rats were subjected to 14 days of restriction of movement on hypnotic activity of sodium barbital (BAR) 300, 250 and 200 mg/kg I.P. Time of loss and regaining of righting reflex were recorded, 2 hrs (dose 1) and 26 hrs (dose 2) after stress. In the stressed rats tolerance developed toward dose 2 with each dosage. After BAR, 200mg/kg, plasma corticosterone (COR) was lower in stressed rats at time of loss of righting reflex (TLRR) after doses 1 and 2. However, TLRR did not differ in the 2 groups. Stressed rats showed decreased sleep time after dose 2 without appreciable difference in COR level. The enzyme inhibitor beta-diethylaminoethylphenylpropylacetate hydrochloride (SKF-525A), 50mg/kg I.P., was injected 45 min before BAR, 200mg/kg, doses 1 and 2. SKF-525A increased dose 2 sleep times in stressed and nonstressed rats. SKF-525A did not alter BAR metabolism after dose two in this study. (Author abstract modified)

249280 Horita, A.; Carino, M. A. Department of Pharmacology, University of Washington, Seattle, WA 98195 Studies on the analeptic action of thyrotropin-releasing hormone (TRH) in rabbits. *Pharmacologist*. 17(2):211, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a series of studies on the analeptic action of thyrotropin releasing hormone (TRH) in rabbits were presented. TRH antagonizes various CNS depressants in rats and mice. In studies on the hyperthermic and behavioral effects of TRH injected i.c.v. in rabbits analeptic actions similar to those produced by d-amphetamine were also observed. Rabbits pretreated with TRH (10 to 100microg i.c.v.) do not exhibit the usual anesthesia or loss of righting reflex when given pentobarbital (25mg/kg) i.v. They exhibit some sedation but otherwise appear normal. The antagonism of pentobarbital induced anesthesia may be demonstrated with doses of TRH (less than 10micrograms) which by themselves exert no apparent behavioral effects but which produce a hyperthermic response. Given after pentobarbital, TRH shortens the duration of the anesthesia, and the righting reflex returns within 10 min after TRH administration as compared to 60 min after saline injection. The depressant effects of a variety of other sedatives, tranquilizers, and neuroleptic agents were also reversed by TRH. Only morphine was resistant to the analeptic action of TRH. Morphine rabbits exhibit sedation, loss of righting reflex, analgesia and hypothermia. TRH reversed only the hypothermia. (Author abstract modified)

249288 Huidobro-Toro, J. P.; Huidobro, F.; Way, E. Leong. Department of Pharmacology, Catholic University, Santiago, Chile Studies on single dose tolerance development to morphine in mice. *Pharmacologist*. 17(2):236, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a series of studies examining single dose tolerance development to morphine in mice was presented. After an adequate single intraperitoneal priming dose of morphine, tolerance to its antinociceptive effect could be demonstrated 48 to 72 hours later. The antinociceptive response to morphine was assessed by the hot plate and the tail flick procedures; tolerance was measured by the shift in the dose response curve of morphine to the right. The threshold dose of morphine to produce single dose tolerance was about 3 to 5 fold greater than that for producing antinociception. Cross-tolerance was exhibited between morphine and methadone and vice versa. The development of single dose tolerance and cross-tolerance between morphine and methadone was inhibited by actinomycin D and cycloheximide injected 30 minutes before the priming dose of morphine or methadone. Intraventricularly injected 5, 6 dihydroxytryptamine, also inhibited the development of single dose tolerance but cyclic AMP and 6-hydroxydopamine were ineffective. Naloxone precipitated withdrawal jumping was not observed when single dose tolerance to morphine was maximal. (Author abstract modified)

249289 Lal, Harbans; Wauquier, Albert; Niemegeers, Carlos. Department of Pharmacology and Toxicology, University of Rhode Island, Kingston, RI 02881 Characteristics of narcotic dependence produced by oral ingestion of fentanyl solutions in rats. *Pharmacologist*. 17(2):237, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the characteristics of narcotic dependence produced by oral ingestion of fentanyl solutions in rats. Individually housed male albino rats were given fentanyl in saccharine (0.2mg/ml) solution as their only source of drinking fluid. Food was available ad libitum. The starting fentanyl concentration

of 0.0083mg/ml was increased on alternate days (except on weekends when the Friday solution was continued) to 0.016, 0.0333, 0.05, 0.0667, 0.0883, 0.1, 0.1167, and 0.133mg/ml. The last concentration was continued for a week before withdrawal. Before withdrawal, these rats did not lose weight, consumed normal amounts of food and ingested higher than normal volumes of fluid. During withdrawal, food and fluid consumption was reduced and all animals showed weight loss, "wet dog" like body shakes, writhing, piloerection, hypothermia, irritability and aggression. When made accustomed to a two bottle choice, most rats preferred fentanyl over saccharine alone. Another group of animals was similarly forced to drink increasing concentrations of loperamide, a nonnarcotic antidiarrheal drug. These rats showed no withdrawal signs and actually exhibited aversion to loperamide or fentanyl in a choice situation. (Author abstract modified)

249381 Johnson, F. N. Department of Psychology, University of Lancaster, Fylde College, Bailrigg, Lancaster, England **The effect of lithium chloride on one-trial passive avoidance learning in rats.** *British Journal of Pharmacology* (London). 56(1):87-91, 1976.

A study examining the expression of a one trial passive-avoidance learning response in rats following injections of lithium chloride or sodium chloride before and after initial training and before the first day of testing is reported. Five tests were given at daily intervals, 24 hr after training being the time of the first test. Lithium given before the first day of testing impaired response expression on the first day and on all subsequent days of testing; the rate of extinction was unaffected. Lithium given both before and immediately after initial training impaired response expression on the first day of testing, but slowed down the subsequent rate of extinction, leading eventually to improved performance on the fifth day, as compared with placebo treated control Ss. Results are interpreted in the light of the hypothesis that lithium impairs the central processing of sensory information. The findings are similar to those of Johnson and Barker (1972) who reported effects of lithium chloride on escape avoidance learning in rats, which they related to a possible drug action on processes interfering with short-term memory consolidation. 18 references.

249419 Johnson, A. M.; Loew, D. M.; Vigouret, J. M. Medicinal Research Centre, Beecham Pharmaceuticals, The Pinnacles, Fourth Avenue, Harlow, Essex, England **Stimulant properties of bromocriptine on central dopamine receptors in comparison to apomorphine, (+)-amphetamine and L-Dopa.** *British Journal of Pharmacology* (London). 56(1):59-68, 1976.

A study investigating the activity of bromocriptine is reported. Tests stimulating the central dopaminergic mechanisms were conducted and the results were compared with those of apomorphine (+)-amphetamine and L-Dopa. Findings indicate that 2.5 to 10mg/kg doses of bromocriptine induced stereotyped sniffing and licking in rats; this effect was more intense than that induced by L-Dopa and less intense than that of apomorphine and (+)-amphetamine over the same doses. In rats lesioned unilaterally in the substantia nigra by local injection of 6-hydroxydopamine, bromocriptine, like the two other compounds, induced turning contralateral to the side of the lesion. Reserpine induced catalepsy in mice was antagonized by bromocriptine, at a potency intermediate to apomorphine and L-Dopa. In all experiments, bromocriptine was characterized by prolonged duration of activity after a delay in the onset of effect. Spontaneous locomotor activity in mice was stimulated by bromocriptine in a dose dependent manner from 2.5 to 10mg/kg after an initial suppression of activity. The stereo-

typed behavior induced by the drug was inhibited by prior administration of pimozide, reserpine, or alpha methyl-p-tyrosine pretreatment. Results indicate that bromocriptine acts by stimulating dopamine receptors in the CNS and that intact catecholamine synthesis and granular amine storage mechanisms are necessary for it to bring about its effects. 39 references.

249485 Glick, Stanley D.; Morihisa, John M. Department of Pharmacology, Mount Sinai School of Medicine, Fifth Avenue and 100th Street, New York, NY 10029 **Changes in sensitivity of morphine-induced circling behaviour after chronic treatment and persistence after withdrawal in rats.** *Nature* (London). 260(5547):159-161, 1976.

The effects of acute morphine administration and the cessation of chronic morphine administration to rats are examined with emphasis on whether either or both can cause spontaneous turning in circles by the rats. Subjects were naive female rats weighing approximately 260g. For measuring rotation, rats were placed individually in a completely automated rotometer which differentiates between complete 360 degree rotations and incomplete oscillatory turns. After habituation for 15 minutes each rat was injected intraperitoneally with morphine sulphate or saline. Rotations were recorded on a printout counter during 60 minutes after injection. Rotations to the left or right were totaled separately and the net positive rotational difference was determined for each rat. It was found that both acute morphine administration and the cessation of chronic morphine administration induce this rotation, which is found to persist for at least two months after withdrawal. It is concluded that the correlation between acute morphine induced rotation and withdrawal induced rotation suggests that long after morphine is eliminated an endogenous substance persists which has at least one pharmacological action resembling that of morphine. This interpretation is consistent with the evidence that rotation is indicative of dopaminergic striatal function, that morphine is known to affect dopaminergic mechanisms in the striatum and that the highest concentrations of opiate receptors and endogenous morphine like substances are found in the striatum. 25 references.

249624 Zettler, G. Abteilung für Pharmakologie, Medizinische Hochschule Lubeck, D-24 Lubeck, Germany **Lubbeck Haloperidol catalepsy in grouped and isolated mice.** *Pharmacology* (Basel). 13(6):526-532, 1975.

A study examining haloperidol catalepsy in grouped and isolated mice is reported. A method was worked out to assess in a quantitative and dose-dependent way the development of catalepsy of mice after low doses of haloperidol. This method was also capable of detecting the anticataleptic effect of phenytoin and the catalepsy-enhancing effect of nikethamide. After 4 weeks isolation, the mice became aggressive and revealed increased susceptibility to the cataleptic effect of haloperidol. The analysis of the data indicates that in these experiments altered central mechanisms were more important than changes of the peripheral pharmacokinetics of haloperidol. 14 references. (Author abstract modified)

249629 Pycok, C. J.; Tarsy, D.; Marsden, C. D. Department of Neurology, King's College Hospital Medical School, Denmark Hill, London SE5, United Kingdom **Inhibition of turning behaviour by clozapine in mice with unilateral destruction of dopaminergic nerve terminals.** *Journal of Pharmacy and Pharmacology* (London). 27(6):445-447, 1975.

A study examining the effect of clozapine on circling behavior in mice with a unilateral destruction of one

nigro/striatal dopamine pathway is reported. Clozapine administration in mice caused a dose dependent inhibition of intensity of both apomorphine and amphetamine induced circling. Results indicate that clozapine is capable of blocking striatal dopamine receptors. More recent biochemical evidence also suggests that clozapine is capable of blocking dopamine receptors in striatum as well as in mesolimbic areas. It is postulated that the failure of clozapine to cause frequent or clearcut extrapyramidal also effects in man when used as a neuroleptic may be due to its inherent potent antimuscarinic properties. Mechanisms for its action are suggested. 20 references.

249668 Zwirner, Peter P.; Porsolt, Roger D.; Loew, Dieter M. Biological and Medical Research Division, Sandoz Ltd., Basle, Switzerland **Inter-group aggression in mice: a new method for testing the effects of centrally active drugs.** *Psychopharmacologia (Berlin)*. 45(2):133-138, 1975.

A new method is described with which the effects of drugs on aggressive behavior can be compared with their effects on general activity. Two groups of three male mice are housed in either half of a macrolon living cage which is divided down the middle by a nontransparent barrier. After 21 days the cage is placed on an activity meter and the dividing wall is removed. The ensuing fighting is scored by an observer and at the same time activity is measured using the activity meter. Using this method it was shown that aggression occurred mainly between groups, with the dominant members doing most of the fighting. It appeared further that the two parameters measured -- aggression and motor activity -- respond differentially to the effects of standard psychotropic drugs. By this means it was possible to distinguish between the effects of chlorpromazine, pentobarbitone, chlordiazepoxide and d-amphetamine. It was also possible to confirm that an experimental compound, YG 19-256, which in other tests has been shown to inhibit aggressive behavior without causing general sedation, also has selective antiaggressive effects in this test. Results indicate that the intergroup aggression test could well be useful in identifying different classes of psychotropic agents. 28 references. (Author abstract)

249669 Jackson, David M.; Anden, Nils-Erik; Dahlstrom, Annica. Department of Pharmacology, University of Sydney, New South Wales 2006, Australia **A functional effect of dopamine in the nucleus accumbens and in some other dopamine-rich parts of the rat brain.** *Psychopharmacologia (Berlin)*. 45(2):139-149, 1975.

In a study of the role of the nucleus accumbens in locomotor activity, dopamine (5 to 50 micrograms) applied bilaterally to the nucleus accumbens of reserpine/nialamide pretreated rats produced a marked dose dependent rise in coordinated locomotor activity, devoid of the stereotypies such as gnawing, rearing and licking seen after dopamine application (50 micrograms) to the neostriatum. The locomotor activity was completely blocked by pimozide, but not by phenoxybenzamine. The effects of apomorphine or d-noradrenaline were similar to those of dopamine. In contrast, l-noradrenaline produced a convulsive syndrome devoid of coordinated locomotor activity, and this convulsive syndrome could be completely blocked by phenoxybenzamine but not by pimozide. Release of endogenous dopamine by d-amphetamine (10 and 50 micrograms) in the nucleus accumbens produced a rise in coordinated activity, the d-isomer was about 4 times as potent as the l-isomer, and the effect of the d-isomer was blocked completely by alpha-methyltyrosine. Bilateral application of trifluoperazine (2.5 micrograms) to the nucleus accu-

bens completely blocked the effect of systemically administered d-amphetamine (1.5 and 3.0 mg/kg), but similar application to the area of the central nucleus of the amygdala or the neostriatum was much less effective. Partial protection of the endogenous dopamine stores against the depleting action of reserpine by local application of metatyramine to the nucleus accumbens resulted in a higher level of basal activity than in control animals. The nucleus accumbens and olfactory tubercles contained most of the dopamine in the limbic forebrain, with noradrenaline more evenly distributed. Data are considered to indicate that the nucleus accumbens plays an important role in the locomotor activity in rats. 43 references. (Author abstract modified)

249670 Jackson, David M.; Anden, Nils-Erik; Engel, Jorgen; Liljequist, Sture. Department of Pharmacology, University of Sydney, New South Wales 2006, Australia **The effect of long-term penfluridol treatment on the sensitivity of the dopamine receptors in the nucleus accumbens and in the corpus striatum.** *Psychopharmacologia (Berlin)*. 45(2):151-155, 1975.

The effect of local application of dopamine to the nucleus accumbens or corpus striatum on locomotor activity was studied in rats 4 days after withdrawal from a 6 weeks term of penfluridol medication. The bilateral application of dopamine into the nucleus accumbens of penfluridol treated rats produced a very marked increase in coordinated locomotor activity which was 3 to 5 times higher than that of rats not treated with penfluridol. This effect of dopamine in both penfluridol treated and control rats was antagonized by intraperitoneally administered haloperidol. The bilateral application of dopamine into the corpus striatum of penfluridol treated animals produced a marked stereotyped behavioural syndrome in all rats studied, whereas no signs of stereotyped behaviour were observed in any of the rats not treated with penfluridol. The results indicate that long-term treatment of rats with the dopamine receptor blocking agent penfluridol produces an increase in the sensitivity of the dopamine receptors in the nucleus accumbens and corpus striatum and that the nucleus accumbens may play a role in locomotor activity. 21 references. (Author abstract)

249671 Stolerman, I. P.; Johnson, C. A.; Bunker, P.; Jarvik, M. E. MRC Neuropharmacology Unit, Medical School, Birmingham B15 2TJ, England **Weight loss and shock-elicited aggression as indices of morphine abstinence in rats.** *Psychopharmacologia (Berlin)*. 45(2):157-161, 1975.

Weight loss and shock elicited aggression are compared as quantitative indices of morphine abstinence in rats. A range of doses of morphine was administered to rats by i.p. injection twice daily for 12 to 15 days. After injections were stopped, morphine abstinent rats lost weight precipitously, and showed an increased frequency of fighting in response to aversive stimulation (footshock). Recovery of weight appeared complete after 15 to 20 days but a significant increase in aggression was found at 18 days postwithdrawal; this effect virtually disappeared after 52 days. Both the amount of weight lost and the frequency of fighting increased as a function of the previous maintenance dose of morphine; the effective dose range appeared similar for these two indices. Since weight loss was much less variable than fighting, and had the advantage of rapid, objective measurement, it is thus considered to be the more reliable index of abstinence. 28 references. (Author abstract)

249672 DeFeudis, P. A.; Paolino, R. M.; DeFeudis, F. V. Departamento de Ciencias Fisiologicas, Facultad de Medicina

Universidad Autonoma, Madrid 34, Spain Effects of d-amphetamine on the incorporation of carbon atoms of D-glucose into the brains of differentially-housed mice. *Psychopharmacologia* (Berlin). 45(2):167-169, 1975.

In a study of changes in cerebral metabolism produced in mice by differential housing, mice were housed either individually (isolated) or in groups of 20 to 25 (aggregated) for 5 to 9 weeks or for 22 weeks. A decreased incorporation of radioactivity into brain from subcutaneously administered U-14C-D-glucose occurred in isolated mice as compared to grouped animals. Amphetamine, administered before labelled glucose, produced a dose dependent decrease of radioactivity which was selective to the brains of the isolated mice. The data support the correlation between isolation induced changes in behavior and central metabolic pathways, and indicate further that these changes may be altered by administration of psychoactive agents. 11 references. (Author abstract modified)

249676 Kitahama, Kunio; Valatx, Jean-Louis. Department de Medecine Experimentale, Universite Claude Bernard, Lyon, France /Action of alpha-methyl-Dopa on waking-sleep cycles in two inbred strains of mice, C57BR and C57BL/6./ Action de l'alpha-methyl-Dopa sur les rythmes veille-sommeil des souris C57BR et C57BL/6. *Psychopharmacologia* (Berlin). 45(2):189-196, 1975.

The effects of alpha-methyl-Dopa at several dose levels on the waking/sleep cycle of 175 mice from two inbred strains (C57BR and C57BL/6) was studied. The results show that each dose (25, 50, 100, 200 and 400mg/kg), of alpha-methyl-Dopa completely suppresses paradoxical sleep (PS), after a period of sedation. Duration of PS inhibition varied as a function of dose, time of injection, and strain of mice. When a multiple injection schedule of one injection per day for 5 consecutive days was used, suppression of nocturnal PS occurred, followed at the 4th day by rebound during daylight hours. Implications of the results for studies of relationships between sleep patterns and learning behavior are considered. 21 references. (Author abstract modified)

249677 Soubrie, P.; Simon, P.; Boissier, J. R. Unite de Recherches de Neuropsychopharmacologie de l'I.N.S.E.R.M., F-75014 Paris, France /Effects of diazepam on six drug-induced locomotor hyperactivities in mice./ Effets du diazepam sur six modes d'hyperactivite chez la souris. *Psychopharmacologia* (Berlin). 45(2):197-201, 1975.

Experiments were carried out in mice to investigate the influence of diazepam (DZP) on dexamphetamine, parachloro-N-methylamphetamine (pCMA), cocaine, morphine, trihexyphenidyl or reserpine (in animals pretreated with monoamine oxidase inhibitor (MAOI)) induced motor hyperactivity. The locomotor hyperactivities induced by dexamphetamine, pCMA, morphine, and cocaine were not reduced by DZP, not even by doses which decrease spontaneous locomotor activity. Low doses of DZP enhance the hyperactivity induced by these compounds. Those induced by trihexyphenidyl or by reserpine (after MAOI) were reduced by DZP at doses which produce no decrease in spontaneous motor activity. Since DZP at low doses potentiates the effects of four different substances, the results can be explained neither by an interference of the benzodiazepine on the metabolism of the drugs nor by a depression of the anxiogenic action of dexamphetamine. Even though it may be difficult to relate the antagonism of DZP on motor activity induced by trihexyphenidyl or on reserpine induced motor hyperactivity (after MAOI) to the suggested anticholinergic and dopaminergic actions of DZP, these effects may partly be involved in the increase in locomotor hyperac-

tivity induced by dexamphetamine, morphine or cocaine. The observed effect of DZP on pCMA induced locomotor hyperactivity does not support a possible antiserotonergic action often suggested to explain the effects of benzodiazepines in conflict situations. 25 references. (Author abstract modified)

249678 Soubrie, P.; Kulkarni, S.; Simon, P.; Boissier, J. R. Unite de Neuropsychopharmacologie de l'I.N.S.E.R.M., Paris, France /Effects of antianxiety drugs on food intake in trained and untrained rats and mice./ Effets des anxiolytiques sur la prise de nourriture de rats et de souris places en situation nouvelle ou familiere. *Psychopharmacologia* (Berlin). 45(2):203-210, 1975.

The effects of various minor tranquilizers on feeding behavior were studied in rats and mice. Benzodiazepines, barbiturates and meprobamate were injected i.p. 30 min before testing and the amount of food consumed during 30 min was recorded. Enhanced food consumption occurred when the animals were in a novel situation, in a situation with which they had previously experienced, or in their home cage, in which they were used to eating in the daytime within 30 min. Studies with two benzodiazepines showed this effect to be maximal between 10 to 20 min after injection and to disappear 4 hrs after injection. Moreover, minor tranquilizers reduced the latency before eating of rats and mice tested in a new situation. These results and the observation of hyperphagia induced by antianxiety drugs in satiated animals suggested that: 1) the enhanced consumption of a nonfamiliar food in a novel situation induced by the minor tranquilizers could hardly be related only to their antianxiety action; 2) the existence of some inhibitory controls (endogenous satiety in daytime or satiety after recent absorption) is not essential for the action of the minor tranquilizers; and 3) an increased motivation and a disruption in the food related behavior could possibly explain all the observed effects. 26 references. (Author abstract modified)

249679 Pycock, C.; Tarsy, D.; Marsden, C. D. Department of Neurology, Institute of Psychiatry, De Crespigny Park, London SE5 8AF, England /Inhibition of circling behavior by neuroleptic drugs in mice with unilateral 6-hydroxydopamine lesions of the striatum. *Psychopharmacologia* (Berlin). 45(2):211-219, 1975.

In a study designed to evaluate the use of the animal model in the study of striatal dopamine receptor activity, the development of circling behavior to apomorphine, amphetamine and L-Dopa in mice with unilateral 6-hydroxydopamine lesions of the dopaminergic nerve terminals in the striatum was examined, and the effects of a range of neuroleptic and sedative drugs on this circling behavior were investigated. Circling induced by all the stimulant drugs was inhibited in a dose dependent manner by haloperidol, pimozide, chlorpromazine, metoclopramide and clozapine (in descending order of potency), but not by phenoxybenzamine, diazepam, promethazine and pentobarbitone sodium. This relatively simple animal model is concluded to be useful for screening neuroleptic drugs which may block striatal dopamine receptors, thereby predicting their potential for causing unwanted extrapyramidal effects but not their antipsychotic efficacy. 31 references. (Author abstract modified)

249680 Kelly, Peter H.; Iversen, Leslie L. University of Cambridge, Psychological Laboratory, Downing Street, Cambridge CB2 3EB, England /LSD as an agonist at mesolimbic dopamine receptors. *Psychopharmacologia* (Berlin). 45(2):221-224, 1975.

A study was conducted to determine whether LSD acts as a dopamine agonist in an in vivo model for assessing drug effects on mesolimbic dopamine receptors. The dopamine agonist apomorphine (1.0mg/kg i.p.) produced an enhanced stimulation of locomotor activity compared to control animals in rats injected bilaterally 14 days previously with 6-hydroxydopamine (6OHDA) into the nucleus accumbens. (+)-Lysergic acid diethylamide (LSD) also produced a marked stimulation of locomotor activity in the 6OHDA treated animals at a dose (1.0mg/kg i.p.) which was ineffective in control rats. (+)-Bromo-lysergic acid diethylamide (2.0mg/kg i.p.) did not stimulate locomotor activity in 6OHDA treated rats. The locomotor stimulation produced by LSD was blocked by pretreatment with the dopamine antagonist pimozide (0.5mg/kg i.p.). It is concluded that LSD acts as an agonist at mesolimbic dopamine receptors. 20 references. (Author abstract modified)

249785 Lal, S.; Feldmuller, F. Department of Psychiatry, Montreal General Hospital, Montreal, Quebec, Canada **Effect of amphetamine and apomorphine on brain monoamines and behaviour in the immature and young adult rat.** *Archives Internationales de Pharmacodynamie et de Therapie* (Ghent). 218(2):239-251, 1975.

The effect of amphetamine and apomorphine on brain monoamines and behavior in the 12-day-old rat is investigated and compared with those in the young adult animal in order to understand some of the biochemical events associated with these drug actions. In the immature rat, amphetamine (10mg/kg i.p.) caused an initial increase in forward locomotion, followed 15 min later by intermittent stereotyped behavior (SB). Fifty to sixty five min after injection the animals entered a phase of sleep which lasted 1 to 3 hrs; after this period continuous SB emerged, lasting 2 to 3 hrs. Brain amphetamine levels were elevated throughout the sequence of behavioral effects. Amphetamine caused a decrease in brain dopamine (DA) 4 hrs after injection and a sustained decrease in noradrenaline (NA). In the young adult rat amphetamine caused an increase in forward locomotion, followed 10 to 15 min by continuous SB lasting 4 to 4.5 hrs. The half-life of brain amphetamine was 66 min. Amphetamine increased brain DA and NA within 15 min of injection. In the immature rat, apomorphine (10mg/kg i.p.) caused an initial increase in locomotion which was followed 10 min later by transient intermittent SB. Following this, the animals entered a phase of sleep which lasted about 40 min before intermittent SB reemerged; this persisted for 1 to 2 hrs. Apomorphine caused an increase in NA and a corresponding decrease in DA at 15 and 30 mins after injection after which the levels of these amines returned to normal. In the adult rat SB commenced immediately after injection of apomorphine and lasted 70 min. There were no changes in levels of brain monoamines. It is concluded that there is no clear correlation between behavioral observations and levels of brain monoamines after amphetamine or apomorphine. 42 references. (Author abstract modified)

250008 Gay, Patricia E.; Leaf, Russell C. Camden College of Arts and Sciences, Rutgers University, Camden, NJ 08102 **Rat strain differences in pilocarpine-induced mouse killing.** *Physiological Psychology*. 4(1):28-32, 1976.

Two different strains of rats are compared as to amount of pilocarpine dosage required to induce spontaneous mouse killing. Repeated injections of pilocarpine were found to induce mouse killing in both Holtzman and Long-Evans strain rats. Higher drug doses (15 to 30mg/kg) were required to initiate killing in the Long-Evans animals, but this strain showed rapid onset of killing and continued to kill when given vehicle

alone. Repeated injections of arecoline failed to initiate killing. It is concluded that pilocarpine seems to be idiosyncratic among peripherally induced cholinomimetic agents in that it can reliably induce mouse killing in rats. It is thought that some central action of the drug causes the mouse killing behavior. It is further observed that Holtzman rats seemed to show a larger sex difference in killing induced by pilocarpine than did Long-Evans rats. 16 references. (Author abstract modified)

250010 Yokel, Robert A.; Pickens, Roy. University of Minnesota, Minneapolis, MN 55455 **Extinction responding following amphetamine self-administration: determination of reinforcement magnitude** *Physiological Psychology*. 4(1):39-42, 1976.

Several measures of extinction responding were observed following responding for one of several doses of either dextro or levo amphetamine or dextro and levo methylamphetamine to compare reinforcement magnitudes. After daily 6 h sessions of intravenous self-administration of drug, the drug was replaced by saline and extinction behavior observed. The number of responses to extinction did not differ significantly between drugs and doses used, but extinction times were greater for the larger doses and the dextro isomers. Response rate during extinction appeared to be a function of response rate during drug access, suggesting that the rate of responding was conditioned during drug self-administration. It is concluded that response rate during extinction and time to complete extinction do not appear to be reliable indicators of reinforcement magnitude due to this conditioning effect. 16 references. (Author abstract)

250012 Stern, Jeffrey J.; Cudillo, Cynthia A.; Longuski, Patricia A. University of Michigan, Dearborn, MI 48128 **Estradiol benzoate, norepinephrine, and weight regulatory behavior in female rats.** *Physiological Psychology*. 4(1):45-49, 1976.

The possibility that the brain systems managing weight regulatory behavior are not actually refractory to estradiol but merely exhibiting an elevated threshold to it is investigated. Estradiol benzoate (EB: 0, 10, 25, 50, and 100 micrograms) was administered to prepubertal, pregnant, pseudopregnant, lactating, and ovariectomized female rats. Estradiol decreased feeding and increased locomotion in the ovariectomized rats only. A second experiment examined the eating and activity of these same preparations following intraventricular norepinephrine (NE: 2 micrograms) administration. NE reduced feeding and enhanced activity in all groups. The findings are interpreted to mean that NE mediates estradiol's effect on weight regulatory behavior. 35 references. (Author abstract modified)

250013 Sjoden, Per-Olov; Soderberg, Ulf. Neurophysiological Laboratory, Ulleraker Hospital, Uppsala University, Uppsala, Sweden **Effects of neonatal thyroxine stimulation on adult open-field behavior and thyroid activity in rats.** *Physiological Psychology*. 4(1):50-56, 1976.

Three experiments are reported in which small groups of rats, given either thyroxine (T4) or triiodothyronine (T3) in large doses on day 3 or day 4 after birth, were tested in an open field situation as adults. Ambulation and rearing were significantly increased by neonatal thyroid hormone treatment in both male and female rats. The effects were more pronounced among males than among females and were reduced by adult handling in the female group. With advancing age, rats treated with hormones showed a progressively lower bodyweight than controls. No consistent effect on thyroid up-

take of radioiodine was noticed. The results are discussed with respect to possible implications for the reported adult learning deficits in rats treated in a comparable manner. 35 references. (Author abstract)

250019 Bush, Harold D.; Bush, Mary Ann F.; Miller, M. Ann; Reid, Larry D. Bradley University, Peoria, IL 61606 **Addictive agents and intracranial stimulation: daily morphine and lateral hypothalamic self-stimulation.** *Physiological Psychology*. 4(1):79-85, 1976.

The effects of morphine on hypothalamic medial forebrain bundle self-stimulation are studied. Rats were allowed to press for electrical stimulation of the lateral hypothalamus on days before, during, and after daily morphine or placebo injections. During tests 1 h after morphine injections, press rates were initially depressed at doses of 10mg/kg or greater. As days of testing under daily morphine doses of 10 or 15mg/kg continued, pressing gradually increased 1 h after injections. Four hours after morphine injections with doses of 10 and 15mg/kg, pressing rates were greater than rats' previous rates of pressing and control groups' pressing, and this facilitation did not wane across 20 days of injections. With termination of 20 days of injections, pressing rates generally returned to levels seen prior to days of injections. It is suggested that the facilitation of intracranial self-stimulation at 4 h after injections of moderate doses of morphine might reflect processes germane to morphine's positively reinforcing properties. 25 references. (Author abstract modified)

250021 Smith, Stanley G.; Werner, Toreen E.; Davis, W. Marvin. Department of Pharmacology, University of Mississippi, University, MS 38677 **Comparison between intravenous and intragastric alcohol self-administration.** *Physiological Psychology*. 4(1):91-93, 1976.

Rats were allowed to self-administer solutions of either saline or alcohol (in unit doses of .03, .1, .3, 1.0, and 3.0mg/kg/infusion) by both intravenous and intragastric routes in a study designed to provide directly comparable dose/effect data within and between routes. Data from intravenous subjects showed a trend for the number of infusions to decrease and for the amount of drug self-administered to increase with increases in the unit dose made available. Data from the intragastric subjects showed a trend for both number of infusions and amount of drug self-administered to increase with increases in unit dose. Comparison between routes indicated that more infusions were taken, and a great amount of drug was self-administered with the intravenous route at doses of .1, .3, and 1.0mg/kg/infusion. However, more intragastric infusions were taken at 3.0mg/kg/infusion. These patterns are said to be similar to those observed for intravenous morphine in previous studies, except that ethyl alcohol is found to be much less potent. It is suggested that larger differences between ethyl alcohol unit doses may be required to observe such differences between routes as have been demonstrated for morphine. 11 references. (Author abstract modified)

250061 Manning, Frederick J. Walter Reed Army Institute of Research, Washington, DC 20012 **Chronic delta-9-tetrahydrocannabinol. Transient and lasting effects on avoidance behavior.** *Pharmacology, Biochemistry and Behavior*. 4(1):17-21, 1976.

A study examining the transient and lasting effects of chronic delta-9-tetrahydrocannabinol (THC) administration on avoidance behavior is reported. THC was administered to rats with extensive experience in free operant (Sidman) lever press shock avoidance. Dosing (30mg/kg intragastrically) continued

once daily, 3 hr before testing, for 1 to 6 weeks. Significant changes were noted in the response rates of several animals, but both the magnitude and direction of these were highly variable. However, shock rates were reliably elevated by THC, but complete tolerance was observed within six sessions. In several rats this was followed by sessions with significantly lower shock rates than the predrug baseline. These rats continued to perform at this level of proficiency until THC was discontinued, at which point the baseline was reacquired. It is felt that these data emphasize that an important determinant of tolerance to a drug effect is the consequence of the effect for the organism. 18 references. (Author abstract modified)

250062 Criswell, Hugh E. Department of Psychology, Williams College, Williamstown, MA 01267 **Analgesia and hyperreactivity following morphine microinjection into mouse brain.** *Pharmacology, Biochemistry and Behavior*. 4(1):23-26, 1976.

A study examining the production of analgesia and hyperreactivity by morphine injection into mouse brain as a function of dose, site and strain is reported. Both analgesia and hyperreactivity were observed as dose dependent effects of morphine microinjection into the periaqueductal gray matter of several strains of mice. Analgesia alone was produced by low doses of morphine while at higher doses analgesia was accompanied by hyperreactivity. Strain differences were noted with B6D2F1 mice being more susceptible to the hyperreactivity following morphine than BALB/c mice. 15 references. (Author abstract modified)

250066 Johanson, Chris E.; Balster, Robert L.; Bonese, Kathryn. University of Chicago, Pritzker School of Medicine, Department of Psychiatry, 950 East 59th Street, Chicago, IL 60637 **Self-administration of psychomotor stimulant drugs: the effects of unlimited access.** *Pharmacology, Biochemistry and Behavior*. 4(1):45-51, 1976.

A study examining the effects of unlimited access to psychomotor stimulant drugs through self-administration is reported. Rhesus monkeys surgically prepared with intravenous catheters were given 23 hr daily access to injections of either cocaine, d-amphetamine, l-amphetamine, d-methamphetamine or diethylpropion on a fixed ratio 1 schedule of reinforcement for a maximum of 30 days. Responding was maintained by all these drugs but showed both day to day and hour to hour variability. The two animals self-administering 0.2mg/kg/infusion cocaine died in less than five days. All six animals given access to 0.05mg/kg/infusion d-amphetamine or 0.025mg/kg/infusion d-methamphetamine also died, but tended to survive more days than animals exposed to cocaine. Three of the five animals whose responding was maintained by 0.5mg/kg/infusion diethylpropion and one of the two animals whose responding was maintained by 0.05mg/kg/infusion l-amphetamine survived the entire 30 days despite high rates of intake. Food intake was initially decreased, but often returned to predrug levels and was not related to level of drug intake. 13 references. (Author abstract modified)

250067 McBride, W. J.; Hingtgen, J. N.; Aprison, M. H. Basic Neural Sciences Section, Institute of Psychiatric Research, Indiana University School of Medicine, Indianapolis, IN 46202 **Neurochemical correlates of behavior: levels of amino acids in four areas of the brain of the rat during drug-induced behavioral excitation.** *Pharmacology, Biochemistry and Behavior*. 4(1):53-57, 1976.

The levels of GABA, aspartate, glutamate, glycine and alanine are reported in four specific brain areas

(telencephalon, diencephalon/mesencephalon, cerebellum and pons/medulla oblongata) of rats killed during a period of drug induced behavioral excitation. Behavioral excitation was obtained in adult, male Wistar rats working on a Sidman shock avoidance schedule following administration of 2mg/kg tetrabenazine (TBZ) 18 hr after iproniazid (50mg/kg) pretreatment. When compared to trained animals (working on the avoidance schedule but receiving no drugs), the excited rats had increased levels of GABA in the telencephalon and diencephalon/mesencephalon, decreased levels of aspartate in all four brain areas, and a lower content of glycine in the pons/medulla region. The changes in the levels of aspartate in all areas of the brain, GABA in the diencephalon/mesencephalon, and glycine in the pons/medulla were significantly correlated (p is less than 0.01) with the degree of excitation. It was observed that avoidance training alone produced increases in the levels of four amino acids: aspartate in telencephalon and cerebellum, GABA in cerebellum, and glycine and glutamate in the pons/medulla. The injection of iproniazid alone or iproniazid followed by TBZ into naive animals had little effect on the levels of the five amino acids. The data are discussed in terms of aspartate and GABA interacting as neurotransmitters with cholinergic and catecholaminergic and/or serotonergic neurons to produce the behavioral excitation. 28 references. (Author abstract)

250070 Sanger, D. J.; Blackman, D. E. Department of Psychology, University of Birmingham, P. O. Box 363, Birmingham, B15 2TT, England **Rate-dependent effects of drugs: a review of the literature.** *Pharmacology, Biochemistry and Behavior.* 4(1):73-83, 1976.

It has been claimed that the effects of amphetamines on schedule controlled behavior depend to a large extent on the rate of responding in control conditions. A review of the literature shows that there is considerable support for this hypothesis if the behavior is not suppressed by aversive procedures, is not under the control of powerful external stimuli or is not occurring very infrequently. The extension of a rate dependency hypothesis to the effects of other drugs has less empirical support, however. It is argued that many of the procedures used for studying rate dependent drug effects do not provide critical tests of the hypothesis. If it is to be shown unequivocally that it is rate of operant responding which determines the behavioral effects of drugs, it is felt that procedures are needed in which other variables such as reinforcement frequency are more adequately controlled. 123 references. (Author abstract)

250074 Anisman, Hymie. Department of Psychology, Carleton University, Ottawa, Ontario, K1S 5B6, Canada **Role of stimulus locale on strain differences in active avoidance after scopolamine or d-amphetamine treatment.** *Pharmacology, Biochemistry and Behavior.* 4(1):103-106, 1976.

A study examining the role of stimulus locale in strain differences in active avoidance after scopolamine or d-amphetamine treatment is reported. Three strains of mice were trained in a shuttle avoidance task following treatment with scopolamine (2.0mg/kg) or d-amphetamine (3.0mg/kg). When required to run towards light (CS) to avoid shock, A/J mice acquired the response more readily than DBA/2J or C57BL/6J mice. However, when required to run away from the light, the strain differences were eliminated. Under both testing conditions scopolamine and d-amphetamine augmented the performance of A/J mice, but had no effect or even disrupted performance of C57BL/6J. In DBA/2J mice d-amphetamine augmented performance only in the toward condition. Results

are interpreted to support the hypothesis that scopolamine and d-amphetamine improve performance by response disinhibition and response excitation, respectively. The presence of associative difficulties limit the effects of these agents. 15 references. (Author abstract modified)

250075 Herberg, L. J.; Stephens, D. N. Institute of Neurology, National Hospital, Queen Square, London WC1, England **Cyclic AMP and central noradrenaline receptors: failure to activate diencephalic adrenergic feeding pathways.** *Pharmacology, Biochemistry and Behavior.* 4(1):107-110, 1976.

A study examining the effects of intracranial injection of graded doses of dibutyryl 3',5'-cyclic adenosine monophosphoric acid (cAMP) at sites in the accumbens/stria terminalis nuclei of satiated rats is reported. Injected cAMP was found to elicit behavioral arousal and occasional convulsive episodes at higher doses, but failed to affect food consumption even in sites where injection of noradrenaline (65 nmol) consistently elicited increased feeding. Intracranial aminophylline (550 nmol) or dopamine (65 nmol) were also without effect on food consumption. This result does not support recent suggestions that cAMP serves as the second messenger in central noradrenergic motivational pathways. 35 references. (Author Abstract modified)

250077 Turnbull, Michael J.; Watkins, John W. Biology Department, ICI Pharmaceuticals Division, Mereside Alderley Park, Macclesfield, Cheshire SK10 4TG, England **Acute tolerance to barbiturate in the rat.** *European Journal of Pharmacology (Amsterdam).* 36(1):15-20, 1976.

A study comparing three experimental approaches to the quantitation of acute barbiturate tolerance in rats is reported. No difference was found between the brain hexobarbitone or barbitone concentration found at the time of loss of righting reflex compared with the concentration found on return of the righting reflex following the period of anesthesia produced by a single i.p. injection of the drug. However, tolerance was induced by a 7 hr infusion of pentobarbitone which kept rats anesthetized for approximately 8 hr. Such rats awakened with a significantly higher brain pentobarbitone concentration compared with rats awakening after a single i.p. injection. Repeated i.p. injections of pentobarbitone, sufficient to keep animals anesthetized for 12 hr, also induced a tolerance to pentobarbitone, as indicated by a reduced sleeping time and higher brain barbiturate concentration on awakening following intracerebroventricularly administered pentobarbitone injected after the last i.p. injection. The possible relationship between acute cellular tolerance and physical dependence is discussed. 25 references. (Author abstract modified)

250079 Bhargava, Hemendra N.; Way, E. Leong. Department of Pharmacognosy and Pharmacology, College of Pharmacy, University of Illinois at the Medical Center, Chicago, IL 60612 **Morphine tolerance and physical dependence: influence of cholinergic agonists and antagonists.** *European Journal of Pharmacology (Amsterdam).* 36(1):79-88, 1976.

A study assessing the effects of centrally acting agents which alter cholinergic activity in mice rendered tolerant to and dependent on morphine (M mice) and in naive mice (N mice) is reported. In both N and M mice, physostigmine potentiated morphine analgesia slightly, and this action was blocked by atropine and scopolamine. When administered 10min before naloxone in dependent mice atropine enhanced precipitated withdrawal jumping; when given 30min before naloxone, atropine produced an inhibition of the response. Physostigmine and oxotremorine greatly inhibited the jumping

response, while echthiophate had no effect. The inhibitory effect of physostigmine on naloxone precipitated withdrawal jumping was reversed by atropine and scopolamine but atropine did not alter morphine tolerance and dependence development. Brain acetylcholine (ACh) levels in both N and M mice were increased by physostigmine, the increase being greater in M mice. This increase was blocked by prior administration of atropine or scopolamine. When atropine was administered to M mice 10 min before sacrifice, brain ACh levels decreased. However, when brain ACh levels were determined 30 min after atropine, no change was found. It is concluded that ACh does not play a major, direct role in the development of tolerance and dependence, but that ACh is involved in the manifestations of acute morphine effects and in some of the withdrawal signs in the dependent state. 26 references. (Author abstract)

250083 Trulson, Michael E.; Jacobs, Barry L. Department of Psychology, Princeton University, Princeton, NJ 08540 **Behavioral evidence for the rapid release of CNS serotonin by PCA and fenfluramine.** *European Journal of Pharmacology* (Amsterdam). 36(1):149-154, 1976.

A study is reported seeking behavioral evidence for the rapid release of CNS serotonin by p-chloroamphetamine (PCA) and fenfluramine (FF). Administration of PCA (2.5 to 10.0 mg/kg) or FF (5.0 to 15.0 mg/kg) to rats induces a behavioral syndrome consisting of tremor, rigidity, Straub tail, hindlimb abduction, lateral head weaving and reciprocal forepaw treading, which is a reflection of the activity of central serotonin mediated synapses. The syndrome appeared within 3 to 5 min following i.p. administration of PCA or FF. The syndrome inducing effects of PCA and FF were blocked by prior depletion of serotonin with p-chlorophenylalanine. By contrast, the syndrome inducing effect of 5-methoxy-N, N-dimethyltryptamine (5-M-DMT), which directly stimulates postsynaptic serotonin receptors was not changed by prior serotonin depletion. Catecholamine depletion with alpha-methyl-p-tyrosine produced essentially no change in the syndrome inducing effects of PCA, FF or 5-M-DMT. These data indicate that the initial effect of PCA or FF administration is the rapid functional release of stored serotonin. 25 references. (Author abstract modified)

250086 Ljungberg, Tomas; Ungerstedt, Urban. Department of Histology, Karolinska Institutet, S-10401, Stockholm 60, Sweden **Automatic registration of behaviour related to dopamine and noradrenaline transmission.** *European Journal of Pharmacology* (Amsterdam). 36(1):181-188, 1976.

A test of an automatic version of the hole board, developed in response to the need for behavioral tests in which behaviors related to dopamine and noradrenaline transmission can be recorded automatically is reported. The test measures two behavior variables: the open-field variable defined as the number of interruptions of photocell beams symmetrically covering an open-field area; and the 'hole' variable, defined as the number of head dips into holes recorded by photocell beams positioned underneath the floor of the cage. The method was evaluated by observations of the rats concomitant with the automatic registrations. The animals were tested on dopamine agonistic drugs, which were found to decrease the hole counts and cause an increase in the open-field counts as compared to saline injected controls. D-amphetamine which is known to increase the release of dopamine as well as noradrenaline caused an increase in both the open-field counts and the hole counts. The increase in hole counts caused by d-amphetamine was reduced when the animals were pretreated

with a dopamine-beta-hydroxylase inhibitor (FLA-63) or a noradrenaline receptor blocker (phenoxybenzamine). These results suggest that the increase in the hole variable was related to an increased noradrenaline transmission while the increase in the open-field variable was related to an increased dopamine transmission. The lowest dose of apomorphine caused a behavioral inhibition which may be explained by a preferential stimulation of dopamine autoreceptors. 18 references. (Author abstract modified)

250089 Glick, Stanley D.; Cox, Russell D. Department of Pharmacology, Mount Sinai School of Medicine, City University of New York, Fifth Avenue and 100th Street, New York, NY 10029 **Differential sensitivity to apomorphine and clonidine following frontal cortical damage in rats.** *European Journal of Pharmacology* (Amsterdam). 36(1):241-245, 1976.

A study examining differential sensitivity to apomorphine and clonidine following frontal cortical damage in rats is reported. Rats trained to bar-press on a FI 15 sec schedule for water reinforcement were administered various doses of apomorphine (0.25-10 mg/kg) and clonidine (0.002-0.1 mg/kg) both before and 6 to 10 weeks after bilateral ablation of frontal cortex. Both drugs monotonically depressed response rates with increasing dose. Frontal cortical lesions increased sensitivity to apomorphine without altering sensitivity to clonidine. The results suggest that the frontal cortex modulates the activity of dopaminergic but not noradrenergic neuronal pathways. 31 references. (Author abstract modified)

250090 Magos, L. MRC Toxicology Unit, Medical Research Council Laboratories, Woodmansterne Road, Carshalton, Surrey, England **The effect of carbon disulphide on the stereotypic effect of dopamine agonists.** *European Journal of Pharmacology* (Amsterdam). 36(1):257-258, 1976.

A study examining the effect of carbon disulphide (CS₂) on the stereotypic effect of dopamine agonists is reported. Exposure to CS₂ was found to increase the intensity of apomorphine induced stereotypy in male rats without increasing the reaction time. With amphetamine, an indirect agonist of dopamine, exposure to CS₂ was found to have a more intensive effect and significantly prolonged the length of reaction. 10 references. (Author abstract modified)

250111 Barrett, James E. Department of Psychology, University of Maryland, College Park, MD 20742 **Effects of alcohol, chlordiazepoxide, cocaine, and pentobarbital on responding maintained under fixed-interval schedules of food or shock presentation.** *Journal of Pharmacology and Experimental Therapeutics*. 196(3):605-615, 1976.

A study is reported examining the effects of alcohol, chlordiazepoxide, cocaine and pentobarbital on responding maintained under a fixed-interval (FI) schedule. Responding by three squirrel monkeys was maintained under multiple component and single component 5 minute FI schedules of either food or electric shock presentation. Under the multiple schedule, a response, after 5 minutes had elapsed, produced either food or shock depending on the prevailing stimulus conditions; single-component FI schedules maintained responding either by food or shock presentation alone. Responding under either the food or the shock schedules was positively accelerated throughout each FI. During certain phases of the experiment, overall response rates maintained by food were comparable to those maintained by shock. Alcohol (1.0-3.0 g/kg), chlordiazepoxide (1.0-10.0 mg/kg) and pentobarbital (1.0-10.0 mg/kg) were found to increase responding maintained by food but to decrease responding maintained by shock.

These effects were obtained under both the multiple component and single component schedules. Low to intermediate doses of cocaine (0.1-1.0mg/kg) were found to increase responding maintained by either food or shock, whereas higher doses (3.0mg/kg) generally decreased responding under these conditions. The effects of chlordiazepoxide were also studied with one monkey when response rates maintained by food or shock were equal, when rates of responding maintained by food were lower than those maintained by shock and, finally, when rates of responding maintained by food were higher than those maintained by shock. Under all of these conditions, chlordiazepoxide was found to increase food maintained response rates and to decrease responding maintained by shock presentation. 29 references. (Author abstract modified)

250112 Wenger, Galen R.; Dews, P. B. Laboratory of Psychobiology, Harvard Medical School, 25 Shattuck Street, Boston, MA 02115 The effects of phencyclidine, ketamine, d-amphetamine and pentobarbital on schedule-controlled behavior in the mouse. *Journal of Pharmacology and Experimental Therapeutics*. 196(3):616-624, 1976.

A study is presented examining the effects of phencyclidine, ketamine, d-amphetamine, and pentobarbital on schedule-controlled behavior in the mouse. The response of mice of breaking a light beam onto a photocell was programmed to produce food according to a multiple schedule with alternating 30 response fixed-ratio, 300 sec fixed-interval (FR-30 FI-300 sec) components. Training was standardized for all mice, and stable patterns of responding that were similar to those described for other species and responses under this schedule developed quickly. At some dose, each of the four drugs produced an increase in rate of responding; the increase was proportionately greater at low rates of responding than at higher rates. At some dose range, d-amphetamine, ketamine and phencyclidine produced dose related increases in FI response rates but only decreases in FR response rates. The maximum increases in FI average rates were to 1.83, 1.25 and 1.32 times the control rate for d-amphetamine (1mg/kg), ketamine (100mg/kg) and phencyclidine (3mg/kg), respectively. Phencyclidine and ketamine thus showed some amphetamine like effects in the mouse. Pentobarbital increased (1.25 times the control rate) both the FR and FI response rates at a dose of 3mg/kg. Higher doses of pentobarbital progressively decreased both FR and FI response rates in a parallel fashion. 26 references. (Author abstract modified)

250113 Goldberg, Steven R.; Morse, W. H.; Goldberg, D. M. New England Regional Primate Research Center, One Pine Hill Drive, Southborough, MA 01772 Some behavioral effects of morphine, naloxone and nalorphine in the squirrel monkey and the pigeon. *Journal of Pharmacology and Experimental Therapeutics*. 196(3):625-636, 1976.

A study examining the effects of morphine, naloxone and nalorphine on the performance of squirrel monkeys and pigeons responding under multiple fixed interval (FI), fixed ratio (FR) schedules of food presentation is reported. Morphine generally produced only dose related decreases in responding in both monkeys and pigeons; monkeys were 10 times more sensitive to morphine than pigeons. The only effect of lower doses of naloxone (0.01 to 1mg/kg, monkeys; 1 to 10mg/kg, pigeons) was to increase FI responding in some pigeons. Higher doses of naloxone (10 to 56mg/kg), produced gross disturbances such as tremors and vomiting and decreased FI and FR responding of both monkeys and pigeons. Nalorphine had strikingly different effects on the behavior of the two species. In the pigeons, nalorphine con-

sistently increased both FI and FR response rates at doses from 0.3 to 10mg/kg and decreased responding only at doses of 30 to 100mg/kg. Nalorphine did not increase responding at any dose in the monkeys, and decreased responding at doses as low as 0.1mg/kg. In both the monkeys and the pigeons, nalorphine was only .10 as potent as naloxone in antagonizing the effects of morphine on FI and FR responding. Decreasing response rates caused by nalorphine appear to further limit its usefulness as a morphine antagonist. Antagonism of the rate decreasing effects of morphine on FI and FR responding occurred over a narrower range of doses with nalorphine than with naloxone, especially in monkeys. 18 references. (Author abstract modified)

250284 Sanders, Barbara. Department of Psychology, Muenzinger Building, University of Colorado, Boulder, CO 80302 Sensitivity to low doses of ethanol and pentobarbital in mice selected for sensitivity to hypnotic doses of ethanol. *Journal of Comparative and Physiological Psychology*. 90(4):394-398, 1976.

Sensitivity to low doses of ethanol and pentobarbital was assessed in mice that had been selectively bred with respect to ethanol sleep time (the length of time an animal remains on its back following a hypnotic dose of ethanol). The hypothesis under investigation was that short sleep (SS) mice might be more sensitive than long sleep (LS) mice to excitatory effects produced by low doses of depressants. In support of this hypothesis, SS mice were more active in an open field test after ethanol than were LS mice. The lines did not differ in performance on a rotating rod apparatus after these same doses of ethanol, suggesting that the difference in open field activity was not attributable to a greater impairment of locomotor activity in LS mice. A similar difference in the open field activity of the selected lines was observed with pentobarbital. 7 references. (Author abstract)

250354 Cowan, Alan. Department of Pharmacology, Pharmaceutical Division, Reckitt and Colman Ltd., Hull HU8 7DS, England Use of the mouse jumping test for estimating antagonistic potencies of morphine antagonists. *Journal of Pharmacy and Pharmacology* (London). 28(3):177-182, 1976.

The potencies of 19 reference morphine antagonists were compared in a modified version of the mouse jumping test. Mice were each implanted subcutaneously with one 75mg pellet of morphine. Antagonist challenge took place 72 hr later and the incidence of repetitive vertical jumping was monitored over 1 hr. A high Pearson correlation coefficient ($r = 0.997$) was found between quantitative assays based on the total number of jumps per mouse and quantal assays based on mice jumping at least six times. A comparison of relative potencies obtained with the mouse test and with nonwithdrawn morphine dependent monkeys gave a Spearman rank order coefficient of 0.91 while a similar comparison with values obtained with the guinea pig isolated ileum preparation also gave a high correlation coefficient ($r = 0.92$). Whereas it is difficult to assess the antagonistic component of buprenorphine and cyclorphan with the ileum preparation, both compounds can be satisfactorily assayed in the mouse jumping test. The reported antagonistic properties of ketocyclazocine and profadol could not be confirmed in the mouse model. 27 references. (Author abstract)

250358 Costall, B.; Naylor, R. J.; Marsden, C. D.; Pycock, C. J. Postgraduate School of Studies in Pharmacology, University of Bradford, Bradford, England Circling behaviour produced by asymmetric medial raphe nuclei lesions in rats. *Journal of Pharmacy and Pharmacology* (London). 28(3):248-249, 1976.

Previous experiments of circling behavior in rats produced by asymmetric medial raphe nuclei (MRN) lesions were repeated with histological examination of the site of the MRN electrolesions and biochemical estimation of monoamines in forebrain structure. Induction of spontaneous and drug induced circling away from the side of the MRN lesion suggests a preferential stimulation of the ipsilateral striatum by a direct stimulation of striatal dopamine receptors or by release of dopamine from the nigrostriatal system. No enhanced sensitivity to dopamine applied directly to the striatum on the side of the MRN lesion was found. Support is shown for the conclusion that the striatal dopamine mechanism, activated by dopamine receptor stimulation, causes circling. No convincing explanation is found as to why an asymmetric MRN lesion causes contraversive turning; it appears to be due to the preferential activity of the ipsilateral striatal complex, but none could be shown to direct intrastriatal application of dopamine. 8 references.

250361 Mogilnicka, E.; Braestrup, C. Polish Academy of Sciences, Institute of Pharmacology, Ojcowska Str. 52, 31-344 Krakow, Poland **Noradrenergic influence on the stereotyped behaviour induced by amphetamine, phenethylamine and apomorphine.** *Journal of Pharmacy and Pharmacology* (London). 28(3):253-255, 1976.

Two experiments on the noradrenergic influence of stereotyped behavior induced by amphetamine, phenethylamine and apomorphine in rats were performed. In the first series the ability of drugs, with effects on central noradrenaline mechanisms, to change sniffing into gnawing or biting was investigated. In the second series evidence was obtained that the transfer from sniffing to gnawing or licking is not a potentiation effect. Together these findings indicate that the expression of dopaminergic induced stereotyped behavior is dependent on the degree of noradrenergic transmission of the CNS. Results imply that noradrenaline influences should be considered in behavioral studies on drugs stimulating the dopamine system. The conclusion implies that central noradrenergic mechanisms should be regarded together with dopamine when the amphetamine model for schizophrenia is used for screening of new antipsychotic drugs or for studies of the pathogenesis of the disease. 18 references.

250658 Davis, W. Marvin; Smith, Stanley G. Department of Pharmacology, School of Pharmacy, University of Mississippi, University, MS 38677 **Effect of haloperidol on (+)-amphetamine self-administration.** *Journal of Pharmacy and Pharmacology* (London). 27(7):540-542, 1975.

The role of brain noradrenaline is investigated in rats by using inhibitors of dopamine-beta-hydroxylase in order to elucidate further the involvement of central neurohumoral systems in the pharmacologic reinforcement evoked by (+)-amphetamine. Results indicate that positive reinforcement associated with (+)-amphetamine fails if synthesis of noradrenaline is blocked. Since a possible joint involvement of dopaminergic and noradrenergic systems has not been excluded, the ability of haloperidol to affect (+)-amphetamine induced reinforcement is tested. Results show that haloperidol can inhibit both the self-administration of (+)-amphetamine and the establishment of a conditioned reinforcer based on (+)-amphetamine as the primary reinforcer. From these data it is suggested that haloperidol or similar drugs have potential value in treatment of drug dependence of the amphetamine type. 6 references.

250941 Gotestam, K. Gunnar; Andersson, Bengt E. Psychiatric Research Center, University of Uppsala, Ulleraker Hospital, Uppsala, Sweden **Assessment of reinforcing properties of amphetamine analogues in self-administering rats.** *Postgraduate Medical Journal* (Oxford). 51(1):80-83, 1975.

At a symposium organized by the Servier Research Institute held in Marbella, Spain March 1974, a study was presented in which the effects of three different amphetamine analogues, phenmetrazine, diethylpropion and fenfluramine, were tested on rats made drug dependent by self-administration of amphetamine. Each of the three amphetamine analogues were substituted for amphetamine one at a time on different experimental days. The phenmetrazine and diethylpropion were self-administered, but the fenfluramine was not. In a second series of experiments, also using amphetamine dependent rats, a single intravenous dose of amphetamine, phenmetrazine, diethylpropion or fenfluramine was given before saline was offered for self-injection. A high rate of responding for saline was observed when amphetamine, phenmetrazine or diethylpropion was given before the session. It was found that pretreatment with saline or fenfluramine gave a low rate of responding. It is concluded that phenmetrazine and diethylpropion have reinforcing properties, whereas fenfluramine does not. It is further concluded that the effect of saline self-administration of a noncontingent dose of phenmetrazine, diethylpropion or amphetamine results in a high rate of responding. Fenfluramine does not show the same effect. 14 references.

250982 Simon, Herve; Le Moal, Michel; Cardo, Bernard. Universite de Bordeaux I, Laboratoire de Psychophysiologie, Institut de Biologie Animale, Avenue des Facultes, 33 405-Talence, France **Intracranial self-stimulation from the dorsal raphe nucleus of the rat: effects of the injection of parachlorophenylalanine and of alpha-methylparatyrosine.** *Behavioral Biology*. 16(3):353-364, 1976.

A study examining the effects of the injection of parachlorophenylalanine and of alpha-methylparatyrosine on intracranial self-stimulation from the dorsal raphe nucleus of rats is presented. A vigorous self-stimulation behavior was obtained from the ventromedian portion of dorsal raphe nucleus of the rat. The electrode placements differ from those of self-stimulation previously observed in this region. The injections of parachlorophenylalanine increase self-stimulation responding rate while the injection of alpha-methylparatyrosine produces a decrease. In the light of recent findings, the possibility of an activating intervention of catecholaminergic (CA) system different from that of the dorsal noradrenergic bundle is discussed. Evidence for an inhibitory role of 5HT neurons on self-stimulation behavior is also found. 49 references. (Author abstract modified)

250984 McGill, Thomas E.; Albelda, Steven M.; Bible, Henry H.; Williams, Christina L. Department of Psychology, Williams College, Williamstown, MA 01267 **Inhibition of the ejaculatory reflex in B6D2F1 mice by testosterone propionate.** *Behavioral Biology*. 16(3):373-378, 1976.

Experiments examining the inhibition of the ejaculatory reflex by testosterone propionate are reported. Testosterone propionate was administered in adulthood to neonatally androgenized female house mice and castrated male house mice of the B6D2F1 genotype. Lengthening of ejaculation latency (a measure of mating time) occurred in both groups. Castrated males showed a proportional increase in Ejaculation Latency with increasing dose. This result, suggests that testosterone propionate inhibits the ejaculatory reflex in this genotype. 11 references. (Author abstract)

251063 Ellison, Gaylord. Department of Psychology, University of California at Los Angeles, Los Angeles, CA 90024 Monoamine neurotoxins: selective and delayed effects on behavior in colonies of laboratory rats. *Brain Research* (Amsterdam). 103(1):81-92, 1976.

The effects on behavior of intraventricular injections of monoamine neurotoxins are investigated in rats. Male laboratory rats raised in two colonies, each of 27 rats, were given intraventricular injections of the norepinephrine neurotoxin 6-hydroxydopamine (6-OHDA) or the serotonin neurotoxin 5,6-dihydroxytryptamine (5,6-DHT) or saline. They were then returned to their enclosure and behavior during the next 50 days was observed. Shortly after neurotoxin injections the 6-OHDA rats spent more time in the burrows than controls and when out were inactive. The 5,6-DHT rats in contrast spent more time in the open than controls, ran more in activity wheels, approached humans, and fought more. Fighting, mounting, and hoarding in the colony gradually increased for 25 days; during this time the status of the 6-OHDA animals fell progressively whereas the 5,6-DHT animals increased in dominance. Social behavior returned to more normal levels after 50 days. It is concluded that several successive stages of behavioral alterations occur following neurotoxin injections. These observations suggest that the low NE and low 5-HT rat can serve as animal models of depression and anxiety: the 6-OHDA rat tends to remain in its burrow and is an inferior in social interactions, whereas the 5,6-DHT rat remains in the open and becomes hyperaggressive. 22 references. (Author abstract modified)

251138 Neill, Darryl B. Department of Psychology, Emory University, Atlanta, GA 30322 Frontal-striatal control of behavioral inhibition in the rat. *Brain Research* (Amsterdam). 105(1):89-103, 1976.

Two experiments were conducted with rats to determine the effects of intrastriatal applications on modified differential reinforcements of low rates (DRL) 30 sec performance and the effects of different prefrontal ablations on modified DRL 30 sec performance. The direct application of crystalline dopamine, d-amphetamine or scopolamine in microgram quantities to the ventral anterior region of the corpus striatum (VAS) of rats increased their responding for food on a modified DRL 30 sec schedule of reinforcement. Similar applications of norepinephrine were less effective than dopamine, while the anticholinesterase eserine depressed responding. Electrolytic lesions of the ventrolateral, but not the dorsomedial, prefrontal cortex of rats also increased their response rates. These results are interpreted as being consistent with the idea of a dopamine acetylcholine antagonism in the VAS whose net output modulates behavioral inhibition. The striatal mechanism may be influenced by the ventrolateral prefrontal cortex. 59 references. (Author abstract modified)

251143 Fergusson, Michael D.; Dill, Russell E.; Dorris, Roy L. Department of Anatomy, Baylor College of Dentistry, Dallas, TX 75226 Importance of O-methylation in dopamine-induced motor and behavioral phenomena. *Brain Research* (Amsterdam). 105(1):163-167, 1976.

By using a monoamine oxidase (MAO) inhibitor, pheniprazine, and a catechol-O-methyl transferase (COMT) inhibitor, tropolone, or a combination of both, the so called dopamine effect was studied in male rats to determine the components of dyskinetic activity that could be clearly attributed to dopamine (DA) and those components that could be attributed to 3-methoxytyramine (3-MT). Cannulae were permanently implanted bilaterally in the neostriatum. Drugs

were injected through the cannulae one week after surgery and subsequently at a rate of once per week. The results show that 3-MT elicits more motor effects, i.e., contralateral forelimb tremor, facial and neck tremor, rearing and torsion, than stereotypic effects. However some components of stereotypy, i.e., head bobbing and mouthing were seen, whereas DA and pheniprazine produced both typical dyskinesias and stereotypy. It appears that a substantial portion of the dyskinetic activity attributed to DA could be attributed to the DA metabolite, 3-MT; however, DA cannot be ruled out as a factor in the production of stereotypic behavior. Since the motor effects seen were dependent upon the presence of an MAO inhibitor and blocked by a COMT inhibitor, it appears that O-methylation is essential in the neostriatum. 18 references.

251215 Weltman, A. S.; Sackler, A. M.; Pandhi, V.; Johnson, L. Laboratories for Therapeutic Research, Brooklyn College of Pharmacy, Long Island University, 598-608 Lafayette Ave., Brooklyn, NY 11216 Behavior and endocrine effects of 3,4,5-trimethoxyamphetamine in male mice. *Experientia* (Basel). 32(3):357-359, 1976.

To observe acute effects of 3,4,5-trimethoxyamphetamine (TMA) on behavior and endocrine activity, male albino mice averaging 25 g were matched by body weights into appropriate test and control groups after prior acclimatization for 1 week in cages containing 4 mice per cage. Effects of single doses of 50 and 100 mg/kg of TMA given i.p. were noted in mice after 40 min and 2.5 h. Locomotor activity was significantly altered and biochemical tests indicated stimulatory effects on adrenocortical and adrenomedullary functions due to TMA. (Author abstract modified)

251216 Soubrie, P.; Simon, P.; Boissier, J. R. Unite de Neuropsychopharmacologie, INSERM, 2, rue d'Alesia, F-75014 Paris, France An amnesic effect of benzodiazepines in rats? *Experientia* (Basel). 32(3):359-360, 1976.

The effect of three benzodiazepines and one neuroleptic on behavioral inhibition in rats is examined in a similar protocol of conditioned emotional response. It is suggested that diazepam, reported to have an amnesic effect in man, although not demonstrated in animal studies, could contribute to the effect of benzodiazepines in some experimental procedures. Lorazepam, diazepam, chlordiazepoxide and chlorpromazine were administered before the learning phase, and the reactivity of animals receiving benzodiazepines was evaluated during the learning stage. Rats exposed after the learning phase to a single extinction session exhibited a reduced behavioral inhibition. It is concluded that benzodiazepines administered after the shock session did not prevent the behavioral inhibition, thus favoring the hypothesis that the memory processes most altered are either the registration phase or those events occurring immediately after it.

251402 Laschka, E. Department of Neuropharmacology, Max-Planck-Institut für Psychiatrie, Kraepelinstrasse 2, 8000 Munich 40, Germany Effect of dopamine agonists and antagonists on asymmetric behaviour occurring during precipitated morphine withdrawal after unilateral inactivation of the striatum in rats. *Naunyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 293(Suppl.):R10, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, 1976, the role of dopamine during precipitated morphine withdrawal is studied in rats. A model was used in which the striatum was unilaterally inactivated by injection of 1 microliter

25% KCl. In naive rats this resulted in little motoric asymmetry. Pretreatment with apomorphine (3mg/kg s.c.) or D-amphetamine, however, induced intense ipsilateral circling, while haloperidol or pimozide caused contralateral torsion of the body. In rats made dependent by repeated implantation of morphine pellets naloxone given systemically immediately before intrastratial KCl injection induced contralateral circling. This was slightly intensified by pimozide and haloperidol and rather strongly enhanced by low doses of apomorphine (0.05mg/kg s.c.) as well as by the DA agonist CB 154. Also drugs affecting other systems as desipramine and atropine increased the contralateral circling. On the other hand, high doses of apomorphine as well as L-Dopa, D-amphetamine and pibedil changed the withdrawal induced direction of circling to ipsilateral. The direction of naloxone induced asymmetric behavior suggests that striatal dopaminergic activity is reduced during precipitated withdrawal; the other results favor the possibility that besides noradrenergic and anticholinergic mechanisms extrastriatal dopaminergic mechanisms are involved in withdrawal hypermotility inducing circling. (Author abstract modified)

251409 Schulze, G.; Burgel, P. Institut für Neuropsychopharmakologie, Freie Universität Berlin, D-1000 Berlin 19, Ullmenallee 30, Germany **Influence of age and drugs on behavioral thermoregulation in rats.** Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R13, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 1976, the influence of age and drugs on behavioral thermoregulation in rats is investigated. It is noted that constant body temperature in homeothermic organisms results from autonomic and behavioral thermoregulatory reactions. Failure of thermoregulation under extreme thermal conditions may be caused by certain drugs or old age. The study focused upon behavioral thermoregulation which contributes to the net phenomenon of body temperature. Female rats (adult: 6-8 months; old: more than 26 months) were put into a cold box. They were trained to press a lever and were rewarded for this behavior by receiving a certain amount of warm air. Saline treated younger animals increased the mean chamber temperature from -4 degrees C to +4 degrees C by a response rate of 0.47; whereas the old animals responded at a rate of 1.34 thereby increasing the mean chamber temperature from -4 degrees C to +9 degrees C. As reported elsewhere one can obtain a dose dependent increase of the response rate in young animals under the influence of phentolamine. This proved to be true also for old animals. Both curves were found to be parallelly shifted, indicating a greater sensitivity of the old animals to the hypothermic effect of phentolamine. It is concluded that this hypothermic effect is apparently not due to an overall reduced load error drive. (Author abstract modified)

251533 Young, Gerald A.; Moreton, J. Edward; Meltzer, Leonard; Khazan, Naim. Department of Pharmacology and Toxicology, University of Maryland School of Pharmacy, Baltimore, MD 21201 **REM sleep distributions in post-addict rat relapsing to morphine self-administration: effects of naloxone subcutaneous pellets.** Research Communications in Chemical Pathology and Pharmacology. 11(3):355-363, 1975.

A study is presented investigating the effects of subcutaneously implanted naloxone pellets on the distribution of REM sleep in postaddict rats relapsing to morphine self-administration. Female Sprague-Dawley rats were prepared with chronic cortical and temporalis muscle electrodes and i.v. cannulas. They were administered i.v. injections of morphine to produce

tolerance and physical dependence, then trained to lever press for i.v. self-injections of morphine (10mg/kg) to maintain dependence. They were subsequently withdrawn for two weeks, implanted subcutaneously with one or two pellets of naloxone base, 100mg each, or placebo pellets, returned to the experimental cages and allowed to relapse to self-administration of either saline or morphine. Rats with placebo pellets relapsed to morphine self-administration and reestablished the dependence state. However, rats implanted with naloxone and then permitted to self-administer morphine extinguished their lever pressing ("drug seeking behavior"). Similar results were obtained with rats implanted with placebo pellets and self-administering saline. The self-injections of morphine by rats implanted with placebo pellets severely suppressed REM sleep and altered its normal distribution. Rats implanted with naloxone pellets and that subsequently extinguished their lever pressing, however, did not exhibit a change in REM sleep distributions. Similarly, self-injections of isotonic saline did not exert an effect on REM sleep distributions. These findings suggest that a correlation between REM sleep distributions, drug seeking behavior, and morphine/naloxone interaction exists. 19 references. (Author abstract modified)

251670 Sanger, D. J.; Blackman, D. E. Department of Psychology, University of Birmingham, P. O. Box 363, Birmingham B15 2TT, England **Schedule-dependent effects of chlordiazepoxide on operant behavior in rats.** Psychological Record. 26(1):131-134, 1976.

The schedule dependent effects of chlordiazepoxide on rats' operant behavior were investigated to determine whether or not they are a result of the control rate of responding. Ss pressed a lever on either a variable interval (VI) or fixed ratio (FR) schedule of food reinforcement. Both schedules maintained similar high overall rates of responding, and a dose of 20mg/kg depressed response rates on both. The effects of lower doses (2.5, 5mg/kg) were schedule dependent, with overall VI response rates being increased but overall FR rates showing no such increase. A possible ceiling effect which prevents the drug from facilitating FR response rates is suggested. It is concluded that the precise nature of response rates contributing to any drug effect must be emphasized, and that other differences between performance maintained by VI and FR schedules should be considered. 12 references. (Author abstract modified)

251699 Borgman, Robert J.; Baldessarini, Ross J.; Walton, Kenneth G. Arnar-Stone Laboratories, Inc., Mount Prospect, IL 60056 **Diester derivatives as apomorphine prodrugs.** Journal of Medicinal Chemistry. 19(5):717-719, 1976.

A series of diesters of apomorphine was synthesized to serve as prodrugs. They were converted in vivo to free apomorphine, which could be detected in the brain. Stereotyped gnawing behavior and unilateral rotation similar to that produced by apomorphine were induced by all of the diesters, but the time course of action of the latter was prolonged. The duration of action generally increased with the size of the ester substituent and appeared to correlate inversely with the rate of hydrolysis of the esters by liver extracts. It is concluded that the diesters serve as prodrugs of apomorphine and their prolonged duration is partly explained by a decreasing rate of hydrolysis attributable to increased steric hindrance at the acyl carbon atoms. 16 references. (Author abstract)

251704 Green, A. R.; Kelly, P. H. MRC Unit and University Department of Clinical Pharmacology, Radcliffe Infirmary, Oxford OX2 6HE, England **Evidence concerning the involve-**

ment of 5-hydroxytryptamine in the locomotor activity produced by amphetamine or tranylcypromine plus L-Dopa. *British Journal of Pharmacology* (London). 57(1):141-147, 1976.

Evidence concerning the involvement of 5-hydroxytryptamine (5-HT) in the locomotor activity produced by amphetamine or tranylcypromine plus L-Dopa is presented. Pretreatment of rats with p-chlorophenylalanine (PCPA; 2 x 200mg/kg) decreased the concentration of 5-HT in the brain. It also decreased the locomotor activity produced by tranylcypromine plus L-Dopa administration 24 hr after the second dose of PCPA. Pretreatment with p-chloroamphetamine, which produced a similar decrease in brain 5-HT concentrations, did not decrease the locomotor response to tranylcypromine and L-Dopa. PCPA pretreatment decreased the rise in the concentration of Dopa and dopamine in the brain following tranylcypromine and L-Dopa, suggesting its effect on the dopamine induced locomotor activity was the result of this drug diminishing dopamine formation in the brain, probably by inhibiting L-Dopa uptake. The locomotor activity produced by tranylcypromine and L-Dopa was not decreased by pretreatment 6 hr earlier with disulfiram (400mg/kg). It is thought that this argues against the locomotor activity being due to noradrenergic stimulation. PCPA pretreatment did not alter amphetamine induced stereotypy or the circling behavior in unilateral nigrostriatal lesioned rats. 43 references. (Author abstract)

251929 Gaito, John. York University, 4700 Keele Street, Downsview, Ontario, Canada M3J 1P3 **The effects of taurine on various stages of the kindling process: a summary of results.** *Bulletin of the Psychonomic Society*. 7(4):397-400, 1976.

The anticonvulsant potential of taurine with an experimentally induced seizure, the "kindling effect", is investigated. Five experiments were conducted in which taurine was administered to rats at various stages in the kindling process. Amygdaloid stimulation was at 100 microA intensity for 30 sec. Experiments 1, 2, and 3 evaluated the effects of taurine on rats at the clonic convulsion stage with various dosages (50, 100, 200, and 400mg/kg weight). Experiments 4 and 5 were concerned with rats at the exploration and behavioral automatism stages (dosages: 50, 100, and 200mg/kg weight). Rats at the initial stage (normal exploration) which received taurine intraperitoneally were found to reach the convulsion stage later than did rats injected with physiological saline. Taurine administration had no effect when rats were at the behavioral automatism or clonic convulsion stage. A second set of four experiments were conducted which used 50, 100, and 200mg/kg dosages and the duration of stimulation was just above latency threshold. The results were similar to the first set; however, the retardation with rats at Stage 1 was not as pronounced. Results question the kindling effect as a model of epilepsy in general. Taurine is shown to be ineffective in suppressing or moderating behavioral effects, once electrophysiological and neurological changes have occurred. 20 references. (Author abstract modified)

251951 Shaywitz, Bennett A.; Klopfer, Jeffrey H.; Yager, Robert D.; Gordon, Judith W. no address **A paradoxical response to amphetamine in developing rats treated with 6-hydroxydopamine.** *Neurology*. 26(4):363-364, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, it was reported that the administration of d-amphetamine reduces the hyperactivity in 6-hydroxydopamine (OHA) treated rat pups, an effect paralleling the paradoxical response to this agent in children with minimal brain dysfunction. Groups of 6-OHDA treated

and control rat pups were treated with saline or amphetamine (at doses of 0.25, 0.5, .5, 5.0mg/kg) and activity was determined 0 for a 60 minute interval at 8, 12, 15, 19, 22 and 26 days of age utilizing a time sample method. The intracisternal administration of 6-OHDA to 5-day-old rat pups resulted in significant reductions in dopamine, ranging from 21 to 39% of control values. Norepinephrine was not altered. Administration of amphetamine to normal developing rat pups resulted in significant increases in activity. In contrast, administration of amphetamine between 2 to 4 weeks of age to 6-OHDA treated rat pups resulted in significant reductions in total activity at doses of 0.5mg/kg ($F=5.83, df1, 370, p$ less than 0.05), 1.0mg/kg ($F=6, 10, df 1, 359, p$ less than 0.05). The similarity of many of the cardinal features of minimal brain dysfunction in an experimental model produced by depletion of brain dopamine in developing rats supports the belief that brain monoamines may play a role in the pathogenesis of this disorder. (Author abstract modified)

251975 Holtzman, Stephen G. Emory University, Department of Pharmacology, Atlanta, GA 30322 **Comparison of the effects of morphine, pentazocine, cyclazocine and amphetamine on intracranial self-stimulation in the rat.** *Psychopharmacologia* (Berlin). 46(3):223-227, 1976.

A study was conducted to compare the effects of morphine with those of pentazocine and cyclazocine on self-stimulation behavior in the rat. Rats were trained to press a lever in order to stimulate their lateral hypothalamus through a chronically implanted electrode. Dose response curves were determined for the effects of morphine (0.3 to 30mg/kg), pentazocine (1.0 to 30mg/kg), cyclazocine (0.03 to 3.0mg/kg) and d-amphetamine (0.1 to 3.0mg/kg) on responding for intracranial stimulation, and then were redetermined in the presence of one or two doses of naloxone. The three analgesics produced only dose related decreases in responding with the following relative potencies: cyclazocine was greater than morphine which was greater than pentazocine. The well documented rate increasing effects of d-amphetamine on intracranial self-stimulation were observed at 0.3 and 1.0mg/kg of the drug; decreases in responding at 3.0mg/kg were associated with stereotyped behavior. Naloxone, which had no effect of its own on self-stimulation, increased the dose of the analgesics required to depress response rate in a manner consistent with a competitive antagonism. In contrast, response rates were reduced at all doses of d-amphetamine tested in the presence of naloxone. Thus, the interaction between naloxone and d-amphetamine is qualitatively different from the one between naloxone and the analgesics. This finding extends to intracranial self-stimulation the generality of a previous report of interactions between d-amphetamine and naloxone on behavior in the rat. 16 references. (Author abstract modified)

251976 Balster, Robert L.; Kilbey M. Marlyne; Ellinwood, Everett H., Jr. Pharmacology Department, Medical College of Virginia, Virginia Commonwealth University, Richmond, VA 23298 **Methamphetamine self-administration in the cat.** *Psychopharmacologia* (Berlin). 46(3):229-233, 1976.

A procedure for studying intravenous drug self-administration in the cat is described. Ten cats were given 24 h access to methamphetamine reinforcement (0.04mg/kg/inj.). The subjects maintained a significantly higher response rate for drug reinforcement than for saline. The pattern of self-administration over days, alternated between periods of high and low drug intake. Six additional cats were used to study the effect of dose per injection on methamphetamine self-administration under conditions of limited access. When methamphetamine was sub-

stituted at various doses per infusion in animals maintained on cocaine reinforcement, response rate was shown to be an inverted U shaped function of dose. These studies demonstrate that methamphetamine is a reinforcer in the cat and its patterns of intake under conditions of 24 h and limited access resemble other species. 15 references. (Author abstract)

251977 Bueno, O. F. A.; Carlini, E. A.; Finkelfarb, Estera; Suzuki, Jacira S. Departamento de Psicobiologia, Escola Paulista de Medicina Rua Botucatu, 862, C. P. 20399, 04023 Sao Paulo-Brazil **Delta9-tetrahydrocannabinol, ethanol, and amphetamine as discriminative stimuli-generalization tests with other drugs.** *Psychopharmacologia (Berlin)*. 46(3):235-243, 1976.

Some discriminative stimulus characteristics of the cannabinoids, especially those of delta9-tetrahydrocannabinol (THC) are studied in the rat. Three groups of rats (A, B, C) were trained in a T-maze to discriminate between drug and control solution induced internal discriminative stimuli. The drugs used to induce discriminative stimuli were: delta9-THC, 5.0mg/kg (Group A); ethanol, 1.2g/kg (Group B), and amphetamine, 1.0mg/kg (Group C). After discrimination acquisition several drugs were tested for generalization in each group. Group A was tested with delta9-THC, cannabidiol (CBD), cannabinol (CBN), ethanol, pentobarbital, chlorpromazine, amphetamine, and apomorphine; only delta8-THC and CBN induced delta9-THC like responses. Group B was tested with delta9-THC, delta8-THC, CBD, CBN, pentobarbital and amphetamine; pentobarbital induced ethanol like response. Group C was tested with delta9-THC, apomorphine, and ethanol; delta9-THC and apomorphine elicited amphetamine like responses. 31 references. (Author abstract modified)

251978 Frumkin, Kenneth. 2405 Edge Hill Road, Huntingdon Valley, PA 19006 **Differential potency of taste and audiovisual stimuli in the conditioning of morphine withdrawal in rats.** *Psychopharmacologia (Berlin)*. 46(3):245-248, 1976.

An investigation of the role of taste and audiovisual stimuli in the conditioning of naloxone's effects on morphine dependent rats is reported. Morphine dependent rats that underwent naloxone precipitated withdrawal in the presence of both gustatory and audiovisual stimuli subsequently avoided the taste cue, but not the audiovisual one. All environmental stimuli did not associate equally with withdrawal in the rat. It is suggested that the role of stimulus factors should be investigated in other forms of narcotic related conditioning. 20 references. (Author abstract modified)

251979 Waser, Peter G.; Martin, Anne; Heer-Carcano, Luzie. Institute of Pharmacology, University of Zurich, Gloriastrasse 32, CH-8006 Zurich, Switzerland **The effect of delta9-tetrahydrocannabinol and LSD on the acquisition of an active avoidance response in the rat.** *Psychopharmacologia (Berlin)*. 46(3):249-254, 1976.

The course of active avoidance learning of rats in a symmetrical Y-maze under the influence of 1, 3, and 9mg/kg delta9-tetrahydrocannabinol (THC) i.p., and 5, 20, and 100micromg/kg of LSD was investigated. Delta9-THC in a dosage of 1mg/kg had no effect on avoidance learning. Three and to a lesser extent 9mg/kg produced more rapid learning with a significantly better performance. Learning under delta9-THC proved to be state dependent. The withdrawal of delta9-THC caused a decrease in the avoidance rate, which was dependent on the dosage. Upon renewal of the THC doses, the animals retained their earlier performance. In the course of the experiment there was rapid tolerance development, especially of the

sedative properties of THC. LSD retarded the rate of acquisition of the active avoidance response. Whereas the control animals displayed over 80% successful active avoidance from the 14th session onwards, this was achieved by the LSD groups only after the 20th session. However, in contrast to the control group the LSD animals were unable to increase their avoidance rate to over 90%, and this was maintained to the end of the experiment (a total of 24 sessions with LSD). The sudden withdrawal of LSD produced a fall in avoidance rate, which was dependent on the previous training dosage; as with delta9-THC state dependent learning can also be assumed for LSD. 32 references. (Author abstract)

251980 Rigter, Henk; Popping, Annemarie. Pharmacology Department, Scientific Development Group, Organon Oss, The Netherlands **Hormonal influences on the extinction of conditioned taste aversion.** *Psychopharmacologia (Berlin)*. 46(3):255-261, 1976.

The effects of adrenocorticotrophic hormone (ACTH) analogues, alpha-MSH, and MSH inhibiting factor (MIF), on extinction of conditioned taste aversion in the rat are reported. Conditioned taste aversion for a 5% glucose solution (sugar water) was induced in rats by an i.p. injection of LiCl 30 min after the first presentation of sugar water. Extinction of conditioned taste aversion was measured either in the forced drinking test or in the preference drinking test. In the forced drinking test sugar water was the only fluid presented to the animals during extinction sessions. In the preference drinking test the animals had the choice of tap water or sugar water. The rate of extinction was much slower in the preference test. The ACTH analogues, ACTH4-10 and ACTH4-10 7DPhe and alpha-MSH delayed extinction in the preference test but not extinction in the forced drinking test. ACTH11-24 was without any effect. MIF facilitated extinction in the forced drinking test but did not alter extinction in the preference test. The peptides did not affect intake of tap water or preference of sugar water over tap water by control rats. 17 references. (Author abstract modified)

251981 Fonseca, Norlandio M.; Sell, Ari B.; Carlini, E. A. Departamento de Farmacologia, Instituto de Ciencias Biomedicas, Universidade Federal do Rio de Janeiro, Brazil **Differential behavioral responses of male and female adult rats treated with five psychotropic drugs in the neonatal stage.** *Psychopharmacologia (Berlin)*. 46(3):263-268, 1976.

The effects on later adult behavior of five different drugs given to infant male and female rats are reported. Male and female rats received during infancy either handling or injections of saline, phenobarbital, haloperidol, diazepam, chlorpromazine, and amphetamine. On reaching adulthood, the behavior of these animals was measured in an open-field arena and in a Lashley III maze. Saline injections per se affected the behavior of males but were unable to change that of females. The drugs provoked increased ambulation and/or decreased defecation of males in the open-field, whereas with the females the opposite was observed, that is, a decreased ambulation and/or an increased defecation. Consequently, the early drug treatments abolished the sexual differences normally observed in ambulation and defecation of rats. Four of the drugs tested deteriorated the maze performance of both male and female rats. 29 references. (Author abstract modified)

251982 Stanes, M. D.; Brown, C. P.; Singer, G. School of Education, Macquarie University, North Ryde, New South Wales, 2113, Australia **Effect of physostigmine on Y-maze discrimination retention in the rat.** *Psychopharmacologia (Berlin)*. 46(3):269-276, 1976.

A series of experiments was designed to assess the effect of physostigmine on the retention of an appetitively reinforced Y-maze discrimination. The results supported in part the model of cholinergic involvement in long-term memory as proposed by Deutsch, in that physostigmine respectively impaired and enhanced well remembered and poorly remembered responses. However a modification of the model was presented to accommodate further findings that variations in both dose level of administered physostigmine and initial learning ability influenced subsequent retention, depending on the training/testing interval. 32 references. (Author abstract)

251988 Beecher, Michael D.; Jackson, Donald E. Department of Psychology, Eastern Michigan University, Ypsilanti, MI 48197 **Rate-dependent effect of amphetamine in rats: extension to between-subjects effect.** *Psychopharmacologia* (Berlin). 46(3):307-309, 1976.

A study was conducted to examine the rate dependent effect of amphetamine where the different rates were generated between subjects. Following either variable interval or fixed interval training, 20 rats received both 0.5 and 2.0 mg/kg of amphetamine. For both schedules, amphetamine decreased response rates of high rate subjects and increased those of low rate subjects. Within subject analysis of fixed interval rates revealed the same rate dependent effect. It is suggested that the between subject and within subject effects may have the same basis. 9 references. (Author abstract modified)

251989 Ageel, Abdulrahman M.; Chin, Lincoln; Trafton, Clinton L.; Jones, Byron C.; Picchioni, Albert L. University of Riyadh, Faculty of Pharmacy, Riyadh, Saudi Arabia **Acute effects of morphine and chlorpromazine on the acquisition of shuttle box conditioned avoidance response.** *Psychopharmacologia* (Berlin). 46(3):311-315, 1976.

A study was conducted in which several levels of task difficulty as well as several drug dose levels were presented to rats in order to determine if acute treatment with morphine or chlorpromazine would interact with task difficulty in a non-linear fashion. Morphine sulfate, 0.25 to 240 mg/kg or chlorpromazine hydrochloride, 0.0625 to 4.0 mg/kg were administered subcutaneously to naive rats 30 min prior to the start of massed trials conditioned avoidance response (CAR) testing. The graded doses of both drugs were applied in each of three CAR task difficulty levels created by manipulation of the duration of conditioned and unconditioned stimuli, intertrial interval and shock intensity. Chlorpromazine, in a dose related manner, caused a decrement in CAR acquisition in all tasks. Morphine, in comparison, produced a biphasic dose response. For a given task difficulty, low doses of morphine enhanced acquisition, whereas higher doses inhibited acquisition. With increasing task difficulty, relatively larger doses of morphine were required to inhibit or facilitate acquisition of CAR. These results emphasize the need to consider not only drug dosage levels, but also the interaction of task difficulty in the application of drugs in learning paradigms. 18 references. (Author abstract modified)

251990 Kobayashi, Masafumi; Arai, Etsuroh. Department of Pharmacology, Nihon University School of Dentistry, Tokyo, Japan **Effect of cortisone, aldosterone and nialamide on "amphetamine stereotypes" and brain methamphetamine levels of adrenalectomized rats.** *Psychopharmacologia* (Berlin). 46(3):317-324, 1976.

A study was conducted to examine the effect of adrenal hypofunction, especially by adrenalectomy, on amphetamine stereotypes. Cortisone, aldosterone or nialamide was ad-

ministered to adrenalectomized or sham operated rats for seven days, and methamphetamine was injected 24 hrs after the last injection of these compounds. Stereotyped head movement and licking activity were scored 5 min, 30 min and 60 min after methamphetamine injection and, in parallel brain methamphetamine levels in similarly treated rats were measured 5 min, 30 min and 60 min after the methamphetamine injection. Adrenalectomy depressed stereotyped head movements but enhanced the brain amphetamine accumulation. Nialamide but not the hormones further increased the amphetamine accumulation in adrenalectomized rats. No drugs had any effect on the amphetamine induced head movement suppressed by adrenalectomy. 25 references. (Author abstract modified)

251991 Tikal, K.; Benesova, O.; Frankova, S. Institute of Pharmacology, Medical Faculty of Hygiene, Charles University, Prague, Czechoslovakia **The effect of pyridoxine and pyridoxine on individual behavior, social interactions, and learning in rats malnourished in early postnatal life.** *Psychopharmacologia* (Berlin). 46(3):325-332, 1976.

An investigation was conducted on the effects of pyridoxine comparison with pyridoxine in rats with two kinds of early malnutrition (protein and calorie) in several behavioral and learning situations in adulthood. Low protein (LP) or low calorie (LC) dietary regimens were applied in early postnatal life (1st through 40th day of life) in male rats. LP malnutrition induced an increase of open-field activity with features of stereotypy both in low intensity and high intensity situations, an increased number of intersignal reactions during learning procedures without changes in other registered criteria of learning ability (latency, number of correct responses), and an increase of aggressive behavior in pair interaction. LC rats revealed only significant inhibition in LI open-field activity and a slightly increased number in intersignal reactions during avoidance learning. With the aim of preventing previously described long-term deviations in early malnourished rats, some groups of animals with early calorie or protein deficits were treated with pyridoxine or pyridoxine in 10 doses of 40 mg/kg i.p. administered in the period when nutritional rehabilitation was carried out (between the 40th through 50th day of life). The treatment with pyridoxine reduced significantly behavioral disturbances in adult LP rats except the increase of intersignal reactions which was even potentiated. Pyridoxine was less effective but normalized the increased number of intersignal reactions both in LP and LC rats. The effect of pyridoxine treatment in early life on learning and dyadic interaction of adult LC rats was interesting. There was significant improvement in all registered parameters of avoidance learning and a significant increase of sexual acts was recorded. 24 references. (Author abstract modified)

252017 Kent, Ernest W.; Fedinets, Paul. Department of Psychology, University of Illinois at Chicago, Chicago, IL 60680 **Effects of GABA blockade on lateral hypothalamic self-stimulation.** *Brain Research* (Amsterdam). 107(3):628-632, 1976.

The role of gamma-aminobutyric acid (GABA) in rat lateral hypothalamic self-stimulation was studied by assessing the effects of two GABA blocking agents (picrotoxin and bicuculline) administered intraperitoneally in various dosages. The effects of the drugs and dosages were also evaluated on an identical lever pressing task which offered a 1 sec escape from footshock as the reinforcer. Results of the self-stimulation tests indicated variation in the effectiveness of the two drugs, with picrotoxin being about twice as effective as bicuculline in terms of dose response measures. In the lever press escape

tests, very stable responding was maintained by all Ss and neither drug disrupted lever pressing even at the highest dosages. Findings demonstrate that two different GABA blocking agents have very similar inhibitory effects on responding for lateral hypothalamic self-stimulation, and that the lack of drug effect on the shock/escape reinforced task indicates that this loss of behavior cannot be ascribed to impairment of any sensory or motor abilities essential to lever pressing performance. 5 references.

252028 Horowski, Reinhard; Wachtel, Helmut. Research Laboratories of Schering AG, Berlin/Bergkamen, Dept. of Neuropsychopharmacology, Mullerstrasse 170-178, 1 Berlin 65 (West), Germany **Direct dopaminergic action of lisuride hydrogen maleate, an ergot derivative, in mice.** *European Journal of Pharmacology (Amsterdam)*. 36(2):373-383, 1976.

An investigation was made of lisuride hydrogen maleate with regard to a potential dopaminergic action in comparison with apomorphine, a direct dopaminergic agonist, and D-amphetamine which is thought to act by releasing dopamine and noradrenaline from extragranular neuronal stores. Lisuride hydrogen maleate induced stereotyped behavior in normal as well as in reserpinized mice. It antagonized the motor depression and hypothermia induced by reserpine. On i.p. administration the compound was about as effective as apomorphine and D-amphetamine. As with apomorphine and in contrast to D-amphetamine the effects of lisuride hydrogen maleate in reserpinized mice were not impaired by additional treatment with alpha-methyl-p-tyrosine methylester. In untreated mice, the substance was very potent in lowering body temperature with significant hypothermia measured after dosages as low as 0.10mg/kg i.p. Occurrence of stereotyped behavior and hypothermia could be prevented by the dopaminergic antagonist haloperidol. From these data it is concluded that lisuride hydrogen maleate in addition to its interaction with serotonergic systems is a potent dopaminergic agonist with a probably direct action on dopaminergic receptors. Further arguments in support of such an action of lisuride hydrogen maleate are, in addition to biochemical data, its serum prolactin lowering effect in rats, its strong emetic action in dogs and its effects on rat behavior. 41 references. (Author abstract modified)

252029 Lassen, Jorgen Buus. Department of Pharmacology, A/S Ferrosan, Sydmarken 1-5, DK-2860 Soeborg, Denmark **Inhibition and potentiation of apomorphine-induced hypermotility in rats by neuroleptics.** *European Journal of Pharmacology (Amsterdam)*. 36(2):385-393, 1976.

The effect of apomorphine (AP) was investigated in rats kept in a familiar cage; 0.25 to 5mg/kg s.c. produced a short lasting, abnormal hypermotility consisting mainly of locomotion and sniffing without grooming. AP was administered to rats pretreated s.c. with various drugs. AP hypermotility was antagonized by 12 neuroleptics from different chemical groups. The AP inhibitory effect of five neuroleptics was decreased when the interval between pretreatment and AP administration was increased from 0.5 to 4 hr. Clozapine was the only neuroleptic showing no inhibition but potentiation at 4 hr. Mepazine, a phenothiazine lacking antipsychotic effects, as well as the NA receptor blockers aceperone and phenox-ybenzamine, did not inhibit AP hypermotility. AP was also given 24 hr after haloperidol and clozapine. At this time both neuroleptics showed AP potentiation. The AP inhibition and potentiation after a single administration of the neuroleptics is presumably due to selective blockade and subsequent supersensitivity of some DA receptors. 51 references. (Author abstract)

252030 Zambotti, Fernanda; Carruba, Michele O.; Barzaghi, Fernando; Vicentini, Lucia; Groppetti, Antonio; Mantegazza, Paolo. Department of Pharmacology, School of Medicine, University of Milan, Via Vanvitelli 32, 20129 Milan, Italy **Behavioural effects of a new non-phenylethylamine anorexigenic agent: Mazindol.** *European Journal of Pharmacology (Amsterdam)*. 36(2):405-412, 1976.

The behavioral effects of Mazindol, a new anorexigenic agent which possesses a different chemical structure from phenylethylamine derivatives such as amphetamines, was studied in rats. Results show that Mazindol causes anorexia along with increases in locomotor activity and body temperature. Mazindol also induces stereotyped behavior and, if injected into rats with unilateral nigro-striatal lesions, causes turning towards the lesioned side. Mazindol induced anorexia is antagonized by pretreatment with alpha-methyl-p-tyrosine or pimozide. Pimozide pretreatment prevents the rotation induced by Mazindol in rats with unilateral nigro-striatal lesions. The involvement of dopamine in the mechanism whereby Mazindol elicits anorexia and turning behavior is discussed. 33 references. (Author abstract modified)

252032 Puech, Alain J.; Simon, Pierre; Boissier, Jacques-R. Departement de Pharmacologie, Faculte de Medecine Pitie-Salpetriere, 91, Bd de l'Hopital Cedex 13, France **Antagonism by sulpiride of three apomorphine-induced effects in rodents.** *European Journal of Pharmacology (Amsterdam)*. 36(2):439-441, 1976.

Three effects of apomorphine (hypothermia and climbing behavior in mice, stereotyped behavior in rats) were studied. Sulpiride antagonized the two effects in mice but stereotyped behavior in rats remained unchanged. Pimozide and haloperidol antagonized the three effects. These results could be explained by the existence of two types of dopaminergic receptors or by the different accessibility to identical dopaminergic receptors located in different CNS areas. 10 references. (Author abstract)

252149 Persinger, Michael A.; Valliant, Paul M.; Falter, Herman. Environmental Psychophysiology Laboratory, Department of Psychology, Laurentian University, Sudbury, Ontario, Canada **Weak inhibitory behavioral effects of postnatal/preweaning taurine injections in rats.** *Developmental Psychobiology*. 9(2):131-136, 1976.

To investigate the long-term behavioral effects of taurine injection during postnatal development, the behavior of rats injected once every 2 days between postnatal days 4 and 20 with 62.5micrograms/g or 125micrograms/g bodyweight of taurine was compared with saline or .5M NaCl injected littermate controls. Taurine injected rats ran significantly less in the running wheel test and displayed lower response/reinforcement ratios following step like changes in an operant task with a schedule for differential reinforcement for low rates of responding (DRL). The quicker adjustments to the changes in DRL schedules did not occur immediately, but rather during sessions following the change. It is concluded that taurine administration during early juvenile development could weakly influence adult inhibitory behavior. 9 references. (Author abstract modified)

252171 Kitahama, Kunio; Valatx, Jean-Louis; Jouvet, Michel. Departement de Medecine Experimentale, Universite Claude Bernard, 8, Avenue Rockefeller, F-69373 Lyon Cedex 2, France **Y-maze learning in two inbred strains of mice. Effects of instrumental and pharmacological deprivation of sleep./ Apprentissage d'un labyrinthe en Y chez deux souches de souris.**

Effets de la privation instrumentale et pharmacologique du sommeil. *Brain Research (Amsterdam)*. 108(1):75-86, 1976.

An investigation of the effects of instrumental and pharmacological deprivation of sleep on Y-maze learning in mice is reported. Two inbred strains of mice (C57BR/cd/Orl and C57BL/6/Orl), having identical sleep rhythms but differing in their ability to learn, were used as subjects. It was found that administration of alpha-methyl-Dopa (100mg/kg) provokes complete suppression of paradoxical sleep from 9 to 11 hours. Injection immediately after each training session over the first 5 days caused a delay in acquisition of an active avoidance task in C57BR mice. Treated C57BL/6 mice exhibited a significant facilitation of acquisition. Similar results were obtained by instrumental deprivation of sleep for 10 hours. 24 references. (Author abstract modified)

252209 Jacquet, Yasuko F.; Carol, Marilyn; Russell, Ian S. New York State Research Institute for Neurochemistry and Drug Addiction, Ward's Island, NY 10035 Morphine-induced rotation in naive, nonlesioned rats. *Science*. 192(4236):261-263, 1976.

An investigation of morphine induced rotation in naive, non-lesioned rats is reported. It was found that in rats injected with morphine in the midbrain reticular formation pronounced ipsilateral rotation behavior can be elicited by mild auditory and visual stimuli, and that the frequency of occurrence and rate of rotation is dose dependent. This effect was site specific and drug specific; other drugs (except heroin) failed to induce this behavior. Naloxone potentiated the morphine rotation. Pretreatment with drugs that either potentiated or attenuated the morphine rotation indicated involvement of the noradrenergic and cholinergic systems and excluded a role for the dopaminergic system. No analgesia was observed after morphine microinjection in this site; thus, the hyperresponsivity to mild auditory and visual stimuli and concurrent analgesia previously seen in animals with morphine microinjections in the periaqueductal gray matter appear to be dissociable effects of morphine, and site specific. 9 references. (Author abstract modified)

252674 Alford, Geary S.; Alford, Harriet F. Department of Psychiatry and Human Behavior, University of Mississippi Medical Center, Jackson, MS 39216 Benzodiazepine induced state-dependent learning: a correlative of abuse potential? *Addictive Behaviors*. 1(3):261-267, 1976.

Using a two way avoidance procedure, the two major benzodiazepines, diazepam and chlordiazepoxide, are tested for state-dependent learning effects in rats. Results showed that compared to saline control animals, subjects receiving diazepam or chlordiazepoxide during extinction displayed significantly more rapid extinction but a significantly greater amount of spontaneous recovery of the conditioned avoidance response. No significant dose/response differences were found. These findings are consistent with Overton's hypothesis that drug state discriminability and state-dependent learning parallel a compound's abuse potential. Drug state discriminability vs state-dependent learning is discussed and a potential relationship between state dependent properties and physical dependence is suggested. 14 references. (Author abstract)

252816 McMillan, D. E.; Healey, M. L. Division of Health Affairs, Department of Pharmacology, Swing Building, Chapel Hill, NC 27514 Some effects of d-amphetamine and pentobarbital on performance under a long fixed-interval schedule. *Journal of the Experimental Analysis of Behavior*. 25(3):389-399, 1976.

An investigation of the effects of d-amphetamine and pentobarbital on pigeons' performance during 3 hr sessions under fixed-interval 60 min schedules of food presentation is reported. Low doses of d-amphetamine increased rates of responding and higher doses decreased rates of responding both during the entire 3 hr session and during each of the individual fixed-intervals. Pentobarbital produced little effect on rates of responding averaged over the 3 hr session, but it decreased rates during the first fixed-interval and increased them during the second and third fixed-intervals. The effects of d-amphetamine are shown to be dependent on the control rate of responding as has been shown with shorter fixed-interval values. Analysis of d-amphetamine effects in terms of the point at which the probability of responding is greater than zero was not descriptive of overall fixed-interval performance. 16 references. (Author abstract)

252824 Schoenfeld, Ronald I. Department of Pharmacology, Squibb Institute for Medical Research, Princeton, NJ 08540 Lysergic acid diethylamide- and mescaline-induced attenuation of the effect of punishment in the rat. *Science*. 192(4241):801-803, 1976.

Lysergic acid diethylamide (LSD), dimethyl-tryptamine (DMT), and delta9-tetrahydrocannabinol (THC) were tested in the rat in a procedure sensitive to benzodiazepines. At a dose as low as 1 microgram per kilogram of bodyweight, LSD significantly decreased the suppressive effect of electric shock on licking behavior of the rat. Attenuation of punishment was also obtained with mescaline, but neither DMT nor delta9-THC was active in this test. Cyproheptadine and alpha-propyl-dopacetamide, drugs that interfere with the function of neurons that contain serotonin, have a behavioral effect similar to that of LSD and mescaline, which suggests that the attenuation of punishment produced by these hallucinogens may result from decreased activity of such neurons. 23 references. (Author abstract modified)

253108 Menon, M. Krishna; Tseng, Liang-Fu; Loh, Horace H. Psychopharmacology Research Laboratory, Veterans Administration Hospital, Sepulveda, CA 91343 Pharmacological evidence for the central serotonergic effects of monomethoxyamphetamines. *Journal of Pharmacology and Experimental Therapeutics*. 197(2):272-279, 1976.

The effects of three monomethoxyamphetamines, dl-paramethoxyamphetamine (dl-PMA), di-meta-methoxyamphetamine (dl-MMA), and dl-ortho-methoxyamphetamine (dl-OMA), and d-amphetamine (d-A) on the myoclonic twitch activity (MTA) of suprahyoid muscle in rats and locomotor activity in rats and mice were studied. PMA, MMA, and d-A were found to increase the MTA, but OMA was ineffective. The increased MTA induced by d-A was not influenced by the blockade of 5-hydroxytryptamine (5-HT) receptor by methysergide or inhibition of 5-HT synthesis by para-chlorophenylamine (PCPA) but was reduced by haloperidol which blocked the dopamine receptor. On the other hand, the increased MTA produced by PMA was not influenced by haloperidol but was reduced by methysergide and PCPA. The increased MTA induced by MMA was not effectively blocked by either PCPA or haloperidol but was blocked by the combination of both PCPA and haloperidol. Results indicate that whereas the increased MTA produced by d-A is not dependent on the availability of 5-HT, PMA exerts its effect by a release of 5-HT and that the MMA effect is due to a release of both 5-HT and dopamine. High doses of PMA and MMA increased the locomotor activity and produced hyperthermia, but OMA was inactive. Findings are in agreement with previous biochemical findings

that PMA releases 5-HT in brain tissue and suggest that PMA exerts its pharmacological effects by releasing 5-HT. 25 references. (Author abstract)

253111 MacPhail, Robert C.; Seiden, Lewis S. Department of Pharmacological Sciences, University of Chicago, 947 East 58th Street, Chicago, IL 60637 **Effects of intermittent and repeated administration of d-amphetamine on restricted water intake in rats.** *Journal of Pharmacology and Experimental Therapeutics*. 197(2):303-310, 1976.

To assess the effects of intermittent and repeated administration of d-amphetamine on restricted water intake, 11 rats had access to water 2 hours daily and intake was measured every 20 minutes. When given intermittently, increasing doses of d-amphetamine (0.05 to 1.6mg/rat) decreased total water intake and altered the within session distribution of intake, with proportionately less intake occurring within early portions of the session after larger doses. Repeated administration of d-amphetamine (0.2, 0.8 or 1.6mg/rat/day) completely attenuated the overall intake decreasing effects of the drug; the time taken for recovery of total intake increased with increasing dose. Despite complete tolerance to its overall intake decreasing effects, d-amphetamine produced persistent dose related effects on the distribution of intake within sessions that were only partially attenuated with continued daily administration of the drug. Tolerance to the overall intake decreasing effect of 1.6mg was accompanied by parallel shifts toward larger doses in the dose effect functions for total water intake and for the within session distribution of intake. Redetermination of the dose effect functions at several times after the repeated administration of 1.6mg generally showed that tolerance of d-amphetamine was lost within 25 to 57 days after discontinuation of the drug. 26 references. (Author abstract modified)

253112 Brase, David A.; Iwamoto, Edgar T.; Loh, Horace H.; Way, E. Leong. Department of Pharmacology, University of California, San Francisco, CA 94143 **Reinitiation of sensitivity to naloxone by a single narcotic injection in postaddicted mice.** *Journal of Pharmacology and Experimental Therapeutics*. 197(2):317-325, 1976.

The phenomenon of morphine priming reinitiating sensitivity to naloxone in the mouse was studied to determine its efficacy as a procedure for detecting and quantifying protracted narcotic dependence. In mice implanted with a morphine pellet for 3 days and subsequently withdrawn for various periods of time, a single injection of morphine resulted in a rapid and marked sensitization of abstinent mice to naloxone induced jumping behavior when compared to abstinent mice pretreated with saline or to placebo withdrawn mice given a single morphine injection. Maximum sensitization of abstinent mice occurred at morphine doses of about 10 to 30mg/kg and peaked at .05 to 2 hours after morphine administration. The ability of morphine to sensitize abstinent mice to naloxone declined with time after pellet removal and appeared to consist of two components, one with a short half-life and one with a much longer half-life. Abstinent mice were also sensitized to naloxone by levorphanol and methadone, but not by dextrorphan. It is proposed that the administration of a narcotic drug to abstinent mice uncovers a latent, preexisting state of physical dependence and restores the responsiveness of this state to naloxone. 33 references. (Author abstract modified)

253255 Geyer, Mark A.; Puerto, Amadeo; Menkes, David B.; Segal, David S.; Mandell, Arnold J. Department of Psychiatry, School of Medicine, University of California, San Diego, La Jolla, CA 92093 **Behavioral studies following lesions of the**

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mesolimbic and mesostriatal serotonergic pathways. *Brain Research (Amsterdam)*. 106(2):257-270, 1976.

The behavior of rats with selective lesions of either the dorsal (B7), median (B8), or lateral (B9) raphe nuclei is compared to that of sham lesioned controls in a variety of experimental situations. The extent of damage to the midbrain raphe nuclei was determined by fluorescence histochemistry, and the tryptophan hydroxylase and tyrosine hydroxylase activities of 6 forebrain regions were measured for each rat. None of the lesions affected tyrosine hydroxylase activity. Lesions of B7, which reduced tryptophan hydroxylase in the striatum, thalamus, cortex, and hypothalamus, had no significant effect on any of the behavioral measures. Lesions of B9 although twice as large, neither reduced forebrain tryptophan hydroxylase significantly nor affected any of the behavioral variables. However, B8 lesions, which reduced hippocampal, septal, cortical, and hypothalamic tryptophan hydroxylase, had behavioral effects similar to those reported after combined raphe lesions or para-chlorophenylalanine. Median raphe lesioned rats were hyperactive when placed in a novel environment and throughout the dark phase of the light/dark cycle. With respect to locomotor activity, B8 lesioned rats were also hyperresponsive to amphetamine. When placed in a stabilimeter and subjected to repeated air puff stimuli, rats with B8 lesions exhibited larger startle responses. Furthermore, only B8 lesioned animals perseverated when given two unreinforced trials in a Y-maze. All these histologic, biochemical, and behavioral variables were assessed individually for all 39 animals, and a multivariate correlational analysis of the data is presented. These experiments suggest that the mesolimbic serotonergic pathway originating in B8 subserves some of the inhibition necessary to dampen behavioral responsivity. 44 references. (Author abstract modified)

253290 Gibbs, Marie E.; Ng, Kim T. Department of Psychology, La Trobe University, Bundoora, Victoria, 3083, Australia **Diphenylhydantoin facilitation of labile, protein-independent memory.** *Brain Research Bulletin*. 1(2):203-208, 1976

Experiments on the effect of diphenylhydantoin (DPH) on ouabain and cycloheximide (CXM) induced amnesia in day old chicks are reported. DPH 10(-4) M administered subcutaneously to chicks 5 min after a one trial passive avoidance learning task successfully counteracted amnesia induced by pretreatment 5 min before learning with ouabain or CXM. Biochemical assays confirmed that in chick forebrain homogenate DPH at concentrations of 1 and 5 X 10(-4) M enhanced Na⁺/K⁺ ATPase activity. Since both DPH and ouabain inhibit posttetanic potentiation, the results support the hypothesis of an initial labile phase of memory based on sodium pump (Na⁺/K⁺ ATPase) activity. DPH was less effective in counteracting ouabain induced amnesia if administered later than 10 min after learning and CXM induced amnesia if administered later than 30 min after learning. This suggests that the effect of DPH on CXM induced amnesia is through enhancement of Na⁺/K⁺ ATPase activity. It is suggested that the possible hyperpolarization of membrane potential associated with sodium pump activity may serve to mark the labile memory trace, enabling formation of a more permanent trace through protein synthesis. 24 references. (Author abstract modified)

253392 Malick, Jeffrey B.; Goldstein, J. M. Biomedical Research Department, Pharmacology Section, ICI United States Inc., Wilmington, DE 19897 **Gamma-aminobutyric acid: selective inhibition of electrically induced head-turning following intracaudate administration.** *Archives internationales de Pharmacodynamie et de Therapie (Ghent)*. 220(2):269-274, 1976.

The effect of intracaudate administration of gamma-aminobutyric acid (GABA) on the headturn response elicited by electrical stimulation of the caudate nucleus of the rat is investigated. GABA antagonized the headturn response in a dose related manner, with maximum effects reported by one minute after infusion, indicating action at the site of stimulation. It is noted that picrotoxin, a GABA antagonist, had a significant effect in preventing the action of GABA on the headturn response. Results indicate that GABA may play an inhibitory role in basal ganglia function. It is proposed that this finding has implications for the symptomatology of Huntington's chorea and the progressive nature of Parkinsonism. It is suggested that extrapyramidal disorders may be the result of imbalances in neurotransmitter ratios and that selective antagonism of the headturn response may be a good experimental model for studying the critical balance and interrelationships between neurotransmitters. 27 references.

253394 Colpaert, F. C.; Niemegeers, C. J. E.; Janssen, P. A. J. Department of Pharmacology, Janssen Pharmaceutica Research Laboratories, B-2340 Beerse, Belgium *Discriminative stimulus properties of analgesic drugs: narcotic versus non-narcotic analgesics*. Archives Internationales de Pharmacodynamie et de Therapie (Ghent). 220(2):329-332, 1976.

The question of whether the ability of drugs to produce analgesia would be a sufficient requirement for the drugs to produce the narcotic cue as well is investigated. Using a food reinforced two lever operant procedure, rats ($n = 6$) were trained to discriminate fentanyl (1.25mg/kg, p.o., t - 60') from solvent (1ml/100g B.W., p.o., t - 60'). The administration of another narcotic analgesic (pethidine) produced a dose related generalization with the standard fentanyl treatment; six non-narcotic analgesics (suprofen, acetylsalicylic acid, indomethacin, phenacerin, phenylbutazone, tolmetin) were found not to do so. It is concluded that the ability of drugs to produce analgesia is not a sufficient condition for the drugs to produce the narcotic cue as well. 10 references. (Author abstract modified)

253450 Tamaki, Yoshitaka; Hidaka, Hiroyoshi. Department of Physiology, Institute for Developmental Research, Aichi Prefectural Colony, Kamiya-cho, Kasugai, Aichi, Japan 480-03 *Behavioral depression in Sidman avoidance learning induced by dopamine beta-hydroxylase inhibitors*. Psychological Reports. 38(2):437-438, 1976.

An experiment designed to discriminate between the peripheral and central effects of dopamine beta-hydroxylase (DB-H) inhibition on Sidman avoidance learning, through administration of Br2FA and YP-279, is reported. Each of nine rats was given three training sessions under drug or vehicle with two day intervals. The dose of either drug induced nearly equal inhibitory effects of DB-H and both were reported to show an increased number of shocks and decreased number of responses. It is noted that Br2FA treated rats received significantly more shocks and had greater depression of performance level than that of YP-279 treated rats, possibly reflecting DB-H inhibition in the central nervous system. It is suggested that the behavioral depression was caused not only by the inhibition of central DB-H but by the inhibition of peripheral DB-H. On the basis of the present data and other cited data, it appears that postganglionic sympathetic reactions influence behavior at least in this aversive situation. 4 references.

253485 Miley, William M.; Shinn, Bruce Stockton State College, Pomona, NJ *Effect of arousal by social isolation, grouping, and d-amphetamine on inter-male aggression in mice (Mus musculus)*. Psychological Reports. 38(2):635-638, 1976.

The effect of arousal by social isolation, grouping, and d-amphetamine were studied on intermale aggression in mice. Twenty four adult male Swiss-Webster mice were randomly assigned to one of the following four equal experimental groups: a socially isolated group (8 days) which received a high dose of d-amphetamine prior to testing; a socially isolated group which received distilled water prior to testing; a social group of six (8 days) which received a high dose of d-amphetamine prior to testing; and a social group of six which received distilled water prior to testing. In the tests in which experimental animals were paired with stimulus animals who had their olfactory bulbs removed, intermale aggression occurred even in the absence of aggressive retaliation by the stimulus animals. This suggests mutual arousal is sufficient to initiate and maintain biting attacks, aggressive retaliation is not necessary. Extremely high arousal in experimental mice induced by d-amphetamine and social isolation also completely suppressed intermale aggression whereas neither variable did so alone. 9 references. (Author abstract modified)

253593 Judd, A.; Parker, Judith; Jenner, F. A. Med. Res. Council Unit for Metabolic Studies in Psychiatry, Univ. Dept. of Psych., Middlewood Hosp., PO Box 134, Sheffield, S6 1TP, U. K. *The role of noradrenaline, dopamine and 5-hydroxytryptamine in the hyperactivity response resulting from the administration of tranylcypromine to rats pretreated with lithium or rubidium*. Psychopharmacologia (Berlin). 42(1):73-77, 1975.

An investigation was conducted to study the interaction between rubidium chloride (RbCl) and monoamine oxidase inhibitor (MAOI) with respect to both rat activity and cerebral biogenic amines, and to examine the effect of chronic oral administration of lithium and the administration of α -methyl-tyrosine (ampt) on the lithium/MAOI hyperactivity syndrome. The administration of 15 mg/kg tranylcypromine sulphate (Tc) to rats which had been given lithium chloride (LiCl) in the diet for 14 days produced hyperactivity within 4 hours. When LiCl was replaced by RbCl at the same dose, the hyperactivity following Tc increased. 5-Hydroxytryptamine (5HT) accumulation after a monoamine oxidase inhibitor (Tc) increased 46% and 85% respectively above control values by LiCl and RbCl administration. After sodium chloride (NaCl) and LiCl treatment, but not after RbCl treatment, the combination of ampt and Tc produced rat brain concentrations of dopamine significantly below control values. The smaller increase of brain noradrenaline (NA) after Tc and RbCl suggests that a lower percentage of NA is being metabolized by MAO. The hyperactivity syndrome in rats after the administration of LiCl or RbCl and Tc was found to be dependent upon both 5HT and dopamine mechanisms. 14 references. (Author abstract modified)

253643 Braestrup, Claus; Andersen, Henning; Randrup, Axel. Central Laboratory, Sct. Hans Mental Hospital, DK-4000 Roskilde, Denmark *The monoamine oxidase B inhibitor deprenyl potentiates phenylethylamine behaviour in rats without inhibition of catecholamine metabolite formation*. European Journal of Pharmacology (Amsterdam). 34(1):181-187, 1975.

The drug l-deprenyl has been reported to have antidepressant properties, and in the present study three possible mechanisms of action were investigated in animal experiments. l-Deprenyl, which is a type B monoamine oxidase (MAO) inhibitor, was compared to clorgyline, an MAO A inhibitor, with regard to its inhibitory effect on the formation of three major catecholamine metabolites, homovanillic acid (HVA), dihydroxyphenylacetic acid (DOPAC) and 3-methoxy-4-hydroxyphenylglycol (MOPEG) in the rat brain in vivo. Apart

from a difference in dose levels the two drugs showed no difference in the dose response pattern of all three metabolites. Clorgyline inhibited the formation of HVA, DOPAC and MOPEG with an ED-50 of about 0.2mg/kg s.c. and 1-deprenyl inhibited with an ED-50 of about 15mg/kg s.c. This result strongly indicates that the metabolites of both dopamine and noradrenaline are formed by the same type of monoamine oxidase(s), probably type A, in the rat brain in vivo. Antidepressant properties of 1-deprenyl therefore seem to be independent of catecholamine deamination. 1-Deprenyl but not clorgyline (2 or 8mg/kg s.c.) potentiated the stereotyped sniffing behaviour induced by beta-phenylethylamine, a specific substrate for type B monoamine oxidase. This result is discussed in relation to a new hypothesis of phenylethylamine and dopamine involvement in depression. 1-Deprenyl was 10,000 times less potent than DMI as inhibitor of noradrenaline uptake in crude synaptosomes from the occipital cortex of rat brain. Inhibition of noradrenaline uptake was therefore excluded as a possible mechanism for the antidepressant action of 1-deprenyl. 32 references. (Author abstract)

05 TOXICOLOGY AND SIDE EFFECTS

245116 Rouzioux, J. M.; Petit, P.; Badinand, A. Laboratoire Central de Chimie Biologique A, Hôpital Ed.-Herriot, Lyon, France /Acute poisoning by means of a veterinary-used sulfone: a case study/. Intoxication aigue par une sulfone d'usage vétérinaire: a propos d'un cas. Bulletin de Médecine Légale et de Toxicologie Médicale (Lyon). 18(3):191-199, 1975.

A 16 year old girl who took diaminodiphenylsulfone in an attempt at suicide was studied. Effects on the central nervous system, such as cyanosis, tachycardia, nausea, vomiting and periods of agitation, were observed. Treatment consisted of diuresis, blood transfusions, injections of methylene blue and vitamin C, peritoneal dialysis and renal purification. The patient survived without aftereffects.

245405 Martin, Joan C. Department of Psychiatry and Behavioral Sciences, RP-10, University of Washington, Seattle, WA 98195 Effects on offspring of chronic maternal methamphetamine exposure. Developmental Psychobiology. 8(5):397-404, 1975.

The effects of maternal methamphetamine exposure on litter size, stillbirths, and neonatal anomalies were studied in rats. Twenty five pregnant Sprague-Dawley derived rats were administered 1.0, 3.0, or 5.0mg/kg of methamphetamine HCl or saline solution twice daily through pregnancy, beginning on the first day of gestation. The rats were allowed to deliver normally. All females had viable litters except at the 5.0mg/kg level where four of seven failed to deliver; rats given methamphetamine delivered earlier than did controls. Weight gain over gestation decreased as a function of increased drug dose. No gross anomalies were visible in the offspring. Litter size decreased and stillbirths appeared to increase as functions of drug dose, and eye opening was delayed in the drug groups. The 5.0mg/kg offspring made more conditioned avoidance responses than did the 3.0mg/kg and saline offspring. Results are discussed relative to previous research on the effects of maternal ingestion of nicotine and amphetamine. 17 references. (Author abstract modified)

245593 Chopra, Y.M.; Dandiya, P. C. Department of Pharmacology, S. M. S. Medical College, Jaipur, India The relative role of brain acetylcholine and histamine in perphenazine catalepsy and influence of antidepressants and diphenhydramine alone and in combination. Neuropharmacology (Oxford). 14(8):555-560, 1975.

Experiments are performed to correlate the brain content of acetylcholine and histamine in perphenazine induced catalepsy and to examine the protective effects of a number of antidepressants singly or in combination with diphenhydramine in rats. The stage-4 of catalepsy caused by perphenazine was evident within 15 minutes. A concomitant rise in brain acetylcholine and histamine occurred, suggesting that drug induced cataleptic symptoms are produced by a simultaneous increase in brain acetylcholine and histamine, which was found to bear an inverse relation to brain motor activity. All antidepressants examined, either singly or in combination with diphenhydramine, were found to antagonize the perphenazine induced elevation of these amines. The anticholinergic action of the antidepressants is considered to be due to an increase in brain dopamine or to inhibition of release of brain acetylcholine. It is concluded that different stages of catalepsy are correlated with brain histamine content. 38 references. (Author abstract modified)

245596 Anderson, D. J.; Crossland, J.; Shaw, G. G. St. Luke's Hospital, Guildford, Surrey, England The actions of spermidine and spermine on the central nervous system. Neuropharmacology (Oxford). 14(8):571-577, 1975.

Effects of intraventricular spermine and spermidine in mice and rabbits are investigated. These polyamines initially produced sedation and hypothermia. Tachypnoea was observed in rabbits but not in mice. In both species there were anorexia and adipsia lasting more than 24 hours. After several hours, animals given spermine, in particular, became hyperexcitable, convulsions ensued, sometimes fatal. Administration of spermine or spermidine produced quadriplegic paralysis within a few days. Histological examination of paralyzed animals revealed a characteristic pattern of focal encephalomalacic lesions. Invariably, severe lesions involving the pyramidal tract were found in the ventral medulla just under the leptomeninges. Lesions also often occurred in the cervical cord, superficially just under the pia mater. Putrescine injections in mice produced convulsions and paralysis and an increase in brain spermidine and spermine content. 20 references. (Author abstract modified)

246821 Messiha, F. S.; Morgan, M.; Geller, I. Texas Tech. University School of Medicine, Department of Pharmacology, P. O. Box 4569, Lubbock, TX 79409 Ethanol narcosis in mice: effects of L-dopa, its metabolites and other experimental variables. Pharmacology, (Basel). 13(4):340-351, 1975.

Ethanol induced narcosis is studied in mice as a function of pretreatment with L-dopa and its metabolites administered alone or in conjunction with Ro-4-4602, an inhibitor of aromatic-L-amino acid decarboxylase. It is suggested that L-dopa prolongation of ETOH narcosis in mice may be due to formation of one or more toxic metabolites rather than to a direct involvement of dopamine. Ethanol narcosis also was studied in mice as a function of age of animals, concentration of ETOH, ambient temperature and saline pretreatment. Since manipulation of these variables produced alterations in ETOH narcosis, the need for their rigid control is indicated. 35 references. (Author abstract)

247214 Harvey, John A.; McMaster, Scott E. Dept. of Psychology, University of Iowa, Iowa City, IA 52242 Fenfluramine: evidence for a neurotoxic action on midbrain and a long-term depletion of serotonin. Psychopharmacology Communications. 1(2):217-228, 1975.

Evidence that fenfluramine exerts a neurotoxic action on serotonergic neurons in the brain is presented. Male albino rats

were injected intraperitoneally with 100 micromoles/kg of either fenfluramine hydrochloride or p-chloroamphetamine hydrochloride. It was found that neurotoxicity in serotonergic (B-9) cell groups was produced after a single injection of fenfluramine. It is reported that reacting cells throughout this region exhibited an irregular shape and an intense staining of the cytoplasm, while in the caudal one fourth of this region they exhibited a perineuronal space. It is noted that these effects were greatly reduced in the rostral three fourths of the B-9 at 14 and 30 days after a fenfluramine injection. In the caudal one fourth of B-9, however, the neurotoxic action remained prominent and included signs of cellular dissolution. It is concluded from the common neurotoxic effects of p-chloroamphetamine and fenfluramine on the serotonergic cell bodies of the B-9 region that halogenated arylalkylamines may have a common toxic metabolite. 8 references. (Author abstract modified)

248275 Collu, Robert. Centre de Recherche Pédatrique, Hôpital Sainte-Justine, Montreal, Quebec, H3T 1C5, Canada. **Endocrine effects of chronic intraventricular administration of delta9-tetrahydrocannabinol to prepubertal and adult male rats.** *Life Sciences* (Oxford). 18(2):223-230, 1976.

Endocrine effects of delta9-tetrahydrocannabinol (delta9-THC), the psychoactive ingredient of marijuana, on prepubertal and adult male rats are investigated. It had been previously reported that delta9-THC is able to modify some endocrine function in animals as well as in humans. Here it was found that daily intraventricular administration of delta9-THC in microgram amounts for a week had definite endocrine effects in the rats. It was found that prostate weights were reduced and plasma and pituitary levels of growth hormone were increased in prepubertal rats. Pituitary levels of prolactin were found to increase in both prepubertal and adult animals while pituitary and adrenal weights and plasma corticosterone levels were found to increase in adult rats. On the other hand, brain weights were found to be significantly reduced by delta9-THC in prepubertal animals and significantly increased in adult animals. No changes were found in brain levels of noradrenaline, dopamine or serotonin in treated animals. Results indicate that delta9-THC may modify some endocrine functions when injected directly into the brain in microgram amounts; and that young and adult animals may respond differently to the chronic administration of the psychoactive drug, although the difference may be due to a biphasic effect of different doses. 22 references. (Author abstract modified)

248414 Massari, V. John; Sanders-Bush, Elaine. Department of Pharmacology, Vanderbilt University School of Medicine, Nashville, TN. **Synaptosomal uptake and levels of serotonin in rat brain areas after p-chloroamphetamine or B-9 lesions.** *European Journal of Pharmacology* (Amsterdam). 33(2):419-422, 1975.

To determine if the biochemical effects of p-chloroamphetamine (PCA) on the B-9 cell group are due to a selective neurotoxic action, their effect on various parameters of serotonergic cell function was compared to that of electrolytic lesions of the B-9 cell group. In contrast to the pronounced fall in 5-hydroxytryptamine (5HT) levels and synaptosomal uptake caused by p-chloroamphetamine, bilateral lesions of the B-9 cell group caused minimal regional changes, except for 35% decreases in the metathalamus/thalamus. It is concluded that the prolonged biochemical effects of p-chloroamphetamine are not due to a selective cytotoxic action on B-9 cells; and that a lateral 5HT pathway, possibly from the B-9 cell group, projects to the

metathalamus/thalamus. 9 references. (Author abstract modified)

248698 Zivkovic, B.; Guidotti, A.; Revuelta, A.; Costa, E. Laboratory of Preclinical Pharmacology, National Institute of Mental Health, Saint Elizabeth's Hospital, Washington, DC. **20032 Effect of thioridazine, clozapine and other antipsychotics on the kinetic state of tyrosine hydroxylase and on the turnover rate of dopamine in striatum and nucleus accumbens.** *Journal of Pharmacology and Experimental Therapeutics*. 194(1):37-46, 1975.

The biochemical correlates of the extrapyramidal side-effects of various antipsychotics are investigated through an examination of the turnover rate of dopamine (DA) and the kinetic state of tyrosine hydroxylase (TH) in striatum and nucleus accumbens of rats given various doses of different antipsychotics. It was found that a single injection of antipsychotic drugs increased the affinity of TH for 2-amino-4-hydroxy-6,7-dimethyl-5,6,7,8-tetrahydropterine (DMPH4) and the Vmax with respect to tyrosine. The doses of methiothepin, pimozide and haloperidol which increased the affinity for DMPH4 of striatal TH were lower than those required to produce a similar change in the nucleus accumbens. In contrast, thioridazine and clozapine were more effective in nucleus accumbens than in striatum. Chlorpromazine was equally active in these two tissues. Haloperidol increased the turnover rate of dopamine in striatum with doses that are relatively smaller than those required in the nucleus accumbens. Clozapine was more active in increasing turnover rate of dopamine in nucleus accumbens; the activity of chlorpromazine in these two tissues was equal. It is concluded that antipsychotics with high incidence of extrapyramidal side-effects affect the nigrostriatal dopaminergic pathway selectively. (Author abstract modified)

248915 Giusti, G. V.; Carnevale, A. Istituto di Medicina Legale e delle Assicurazioni, Università Cattolica del S. Cuore, 644, via della Pineta Sacchetti, I-00168 Rome, Italy. **Myeloid hyperplasia in growing rats after chronic treatment with delta9-THC at behavioral doses.** *Archiv für Toxikologie* (Berlin). 34(2):169-172, 1975.

The effect of chronic treatment with delta9-THC behavioral doses on myeloid hyperplasia in growing rats from the second to the thirtieth day of life is investigated. A statistically significant myeloid hyperplasia was still persistent four months after the end of the treatment, together with significant blood granulocytosis. It is suggested that the treatment of growing animals with behavioral doses of THC would aid in evaluating, from this point of view, the hazards of marijuana abuse. 12 references. (Journal abstract modified)

249003 Daul, Carolyn Beach; Heath, Robert G. Department of Psychiatry and Neurology, Tulane University School of Medicine, New Orleans, LA 70112. **The effect of chronic marijuana usage on the immunological status of rhesus monkeys.** *Life Sciences* (Oxford). 17(6):875-881, 1975.

In an attempt to resolve the conflicting results of recent studies on the effect of marijuana smoke on the functional capabilities of the immune system, the in vitro immunological status of rhesus monkeys prior to, during, and following a regimen of marijuana smoking was monitored. It was thought that this approach would overcome problems inherent in comparing drug using and nondrug using populations of human volunteers. Marijuana smoke was administered at three delta9-THC levels for a period of 6 months. Following this chronic marijuana usage, plasma immunoglobulin levels were found to

be decreased in those monkeys receiving high and medium dosages. The *in vitro* lymphocyte responsiveness to Concanavalin A was found to be reduced in all monkeys receiving marihuana. It is concluded, however, that at present it is difficult to assess the significance of the reduced immunoglobulin levels and *in vitro* lymphocyte response in terms of the effect of marihuana smoking on the *in vitro* immunological competence of the organism. 25 references. (Author abstract modified)

249234 Gal, J.; Gruenke, L. D.; Castagnoli, N., Jr. Department of Pharmaceutical Chemistry, School of Pharmacy, University of California, San Francisco, CA 94143 *N*-hydroxylation of 1-(2,5-dimethoxy-4-methylphenyl)-2-aminopropane by rabbit liver microsomes. *Journal of Medicinal Chemistry*. 18(7):683-688, 1975.

Metabolic *N*-hydroxylation of the potent psychotomimetic amine 1-(2,5-dimethoxy-4-methylphenyl)-2-aminopropane by rabbit liver microsomal preparations was investigated. A synthetic hydroxylamine was obtained by sequential reduction of the corresponding nitropropene with sodium borohydride followed by zinc reduction of the resulting nitropropane. This hydroxylamine in water (pH 7.4) was rapidly air oxidized to an oxime; this oxidation was completely blocked by rabbit liver microsomes. Microsomal incubations of this amine or one of its bis (methoxy-d3) hexadeuterio analogs resulted in the formation of two enantiomeric products, identified as their bis(trifluoroacetyl) derivatives by GLC-MS. Quantitative estimations of metabolite formation employing selected ion monitoring with the aid of an accelerating voltage alternator were accomplished. 35 references. (Author abstract modified)

249254 Hu, Jean; Ho, I. K. Department of Pharmacology and Toxicology, University of Mississippi Medical Center, Jackson, MS 39216 *Susceptibility to electro-shock convulsion after barbiturate pellet implantation in the mouse*. *Pharmacologist*. 17(2):190, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented which examined the susceptibility to electroshock convulsion displayed by mice in which barbiturate pellets had been implanted. Male ICR mice were rendered tolerant/dependent on barbiturate by subcutaneous implantation of a specially formulated pellet with either 75mg pentobarbital or 16mg barbital for 3 days and this was followed by a second pellet for an additional 3 days. The control group was implanted with placebo pellets in a similar fashion. The sensitivity to electroshock convulsion was determined at various time intervals after the removal of pellets. In mice receiving pentobarbital pellet implants, the mortality due to electroshock at 6, 24, 48 and 72 hrs after pellet removal was 14.3, 23.5, 14 and 11%, respectively, in comparison with 0, 3, 0 and 7.5% for the placebo groups. The mortality for barbital pellets implanted group at similar time intervals was 0, 20, 18 and 0%, respectively. At 24 hrs after pellet removal, the incidence of tonic convulsion was 46.5, 40 and 20%, respectively, for pentobarbital, barbital and placebo treated animals. The data appear to show that after development of dependence by barbiturate pellet implantation, the animals become more sensitive to electroshock induced seizure after pellet removal. (Author abstract modified)

249265 Sharma, R. P. Toxicology Program, Utah State University, Logan, UT 84322 *Neurotoxicity of dieldrin in relation to the serotonin metabolism and acid transport in mouse brain*. *Pharmacologist*. 17(2):203, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented examining the neurotoxicity of dieldrin in relation to the serotonin metabolism and acid transport in mouse brain. Various convulsants are known to produce alterations in the levels or efflux rate of neurohormones in the brain. Chronic administration of dieldrin caused a decrease of brain serotonin (5-HT), norepinephrine and dopamine in Mallard ducks, but it failed to produce a similar effect in mice. The metabolism of 5-HT was investigated in male Swiss White mice fed 40ppm of dieldrin in the diet for 4 weeks. Treated animals had a slightly higher level of 5-hydroxyindole acetic acid (5-HIAA) than controls. The decrease in 5-HIAA levels induced by monoamine oxidase inhibitor (pargyline, 100mg/kg ip) was 17 percent smaller in rate ($k=1.19$ hr⁻¹) vs. 1.43 hr⁻¹) than respective controls. The turnover rate of 5-HT based on 5-HIAA decrease was only slightly (10%) lowered by dieldrin. Following the administration of probenecid (200mg/kg ip) the resulting accumulation rate of 5-HIAA in brain was 56 percent lower in dieldrin treated mice than in controls (0.11 vs. 0.25micrograms). The data suggest a possible influence on acid transport system of Swiss White mouse by dieldrin exposure. Results obtained here emphasize the need in investigations of neurohormone metabolism to consider acid transport in brain. (Author abstract modified)

249317 Gessner, Peter K.; Dankova, Jana B. Department of Pharmacology, State University of New York at Buffalo, Buffalo, NY 14214 *Brain bufotenine from administered acetylbufotenine: comparison of its tremorgenic activity with that of N,N-dimethyltryptamine and 5-methoxy-N,N-dimethyltryptamine*. *Pharmacologist*. 17(2):259, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975, at the University of California, Davis, a study was presented which compared the tremorgenic activity of brain bufotenine (from administered acetylbufotenine) with that of 5-methoxy-N,N-dimethyltryptamine (5MeO-DMT and N, N-dimethyltryptamine (DMT)). Interest in the effects of bufotenine (Bu) on the CNS stems from its possible *in situ* formation by of 5-hydroxytryptamine. The low lipid solubility of Bu however, limits its ability to cross the blood-brain barrier and has hindered direct investigation of its central activity. To circumvent this problem mice were administered i.v. 30micromoles/kg of the acetyl ester of Bu (AcBu), which is more lipid soluble, and were killed by immersion in liquid nitrogen at either 60 or 120 sec postinjection. Assay of brain tissue showed presence of Bu and absence of AcBu at both times. In further experiments mice were administered i.v. various doses of AcBu or 5MeO-DMT and their tremor activity in the period 30 to 120 sec postinjection was determined ballistographically. At 120 sec the mice were killed and their brains assayed as above. Comparison of the tremorgenic activity of Bu, DMT and 5MeO-DMT at similar brain levels revealed Bu to be most active and DMT to be least active. (Author abstract modified)

249929 Beaubien, A. R.; Carpenter, D. C.; Mathieu, L. F. Drug Toxicology Division, Health Protection Branch, Tunney's Pasture, Ottawa, Canada K1A 0L2 *Imipramine enhancement of pentobarbital toxicity in rats*. *Research Communications in Chemical Pathology and Pharmacology*. 13(3):365-378, 1976.

The toxicity of pentobarbital was examined in male Wistar rats pretreated with a nontoxic dose of imipramine (10mg/kg, po). Pentobarbital (70mg/kg, ip) lethality was enhanced up to

6hr after imipramine administration, and pentobarbital (45mg/kg, ip) sleeping time was prolonged up to 12 hr after imipramine. Physiological measurements showed that imipramine pretreatment 2hr prior to pentobarbital (70mg/kg, ip) enhanced barbiturate depression in mean blood pressure, oxygen consumption and respiration rate, but not in heart rate or back skin temperature. Analysis of brain radioactivity after (14C) pentobarbital indicated that these effects of imipramine were not solely the result of inhibition of liver metabolism. 25 references. (Author abstract)

250682 Schain, R. J.; Watanabe, K. Department of Pediatrics, School of Medicine, University of California, Los Angeles, CA 90024 **Origin of brain growth retardation in young rats treated with phenobarbital.** *Experimental Neurology*. 50(3):806-809, 1976.

Experimental studies on rats, using phenobarbital treated, undernourished, and control litters indicate that chronic, sub-hypnotic doses of phenobarbital directly retards brain growth in a manner that is partially independent of reduced food intake. All animals were sacrificed at 21 days. Body, whole brain, and cerebellar weights were recorded. Mean whole brain and cerebellar weights were found to be significantly lower (.001 level), in the phenobarbital treated animals than in the undernourished animals. The brain weight/bodyweight ratio produces generalized growth retardation which affects brain growth, while undernutrition retards brain growth less than other growth aspects. Since phenobarbital is often administered to human infants for long periods for seizure prevention and control, the question is raised of whether continuous phenobarbital administration may, at some dosage, affect the pattern of early human brain development. 11 references.

251428 Hutchings, Donald E.; Hunt, Howard F.; Towey, James P.; Rosen, Tove S.; Gorinson, Howard S. Research Psychology, New York State Psychiatric Institute, 722 W. 168th Street, New York, NY 10032 **Methadone during pregnancy in the rat: dose level effects on maternal and perinatal mortality and growth in the offspring.** *Journal of Pharmacology and Experimental Therapeutics*. 197(1):171-179, 1976.

Four groups of pregnant rats were administered methadone hydrochloride orally on days 8 through 22 of gestation. Each group initially received 5mg/kg for 4 days. One group was maintained at this level and the remaining groups were increased to maintenance doses of 10, 15 or 20mg/kg with 5mg/kg increments at 4 day intervals. An intubation control group received the vehicle only. Nontreated control mothers were left undisturbed. All offspring were fostered to other nontreated mothers at birth. Methadone, particularly at the higher dose levels, reduced maternal weight gain during pregnancy and increased both maternal mortality and total mortality among the young (resorptions plus stillbirths). Birth weight covaried with dose level and litter size: the 5, 10 and 15mg/kg doses yielded litter sizes comparable to, or somewhat smaller than controls, but with lower birth weights; the 20mg/kg doses yielded the smallest litter sizes but with birth weights greater than any other treated or control group. Beyond day 1 of life, treated and control offspring did not differ in mortality. By weaning, the low offspring weights seen at birth had been compensated for and were no longer evident. Body weights of offspring of mothers in the 20mg/kg group remained well above average through weaning. In a second experiment, blood levels of methadone were determined for both mothers and litters in the 5, 10 and 15mg/kg groups, sacrificed 24 hours before expected parturition. It was observed that

blood levels were dose related and corresponded to those found in human subjects receiving daily maintenance doses of approximately 30, 60 and 100mg, respectively. 20 references. (Author abstract)

251629 Martin, Gerard M.; Storlien, L. H. Department of Psychology, Australian National University, Canberra, Australia, 2600 **Anorexia and conditioned taste aversions in the rat.** *Learning and Motivation*. 7(2):274-282, 1976.

The question of whether or not certain anorexic agents produce flavor aversions is investigated. Rats showed comparable anorexia when injected with lithium chloride, ammonium sulfate, arginine HCl, and d-glucose. Only lithium chloride produced a flavor aversion to either a novel liquid or food. Only arginine was found to interfere with the formation or recall of an association. The effects of the other chemicals are discussed in terms of the relationship between anorexia and induced sickness. It is concluded that glucose, ammonium sulfate and lithium chloride may be useful in attempts to determine the aversive properties of chemicals used in taste aversion paradigms. 23 references. (Author abstract modified)

251959 Nausieda, Paul A.; Weiner, William J.; Kanapa, D. J.; Klawans, Harold L. no address **The toxicity of direct-acting dopamine agonists: implications for the therapy of parkinsonism.** *Neurology*. 4(26):373, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, a study was conducted to determine the capacity of bromocriptine, a direct acting agonist of proved clinical efficacy in parkinsonism, to induce receptor site hypersensitivity in guinea pigs. Following four weeks of bromocriptine treatment, animals demonstrated a long standing hypersensitivity to amphetamine and apomorphine. The data suggest that the chronic use of direct dopamine agonists is capable of producing receptor site hypersensitivity. These results may be an indication that direct acting dopamine agonists will offer no advantage over current drugs relative to commonly encountered side-effects and raises some doubts as to whether chronic dopaminergic agonism is the best form of therapy for parkinsonism. (Author abstract modified)

252148 Petit, Ted L.; Isaacson, Robert L. Department of Psychology, University of Florida, Gainesville, FL 32601 **Anatomical and behavioral effects of colchicine administration to rats late in utero.** *Developmental Psychobiology*. 9(2):119-129, 1976.

To ascertain the anatomical and behavioral effects of colchicine administration to rats late in utero, neonate rats were tested by several techniques that have been shown to be sensitive indicators of level of central nervous system functioning. Offspring from pregnant rats injected with .4mg/kg body weight colchicine on embryonic days 18, 19, and 20 were found to have isocortical and hippocampal structures greatly reduced in mass when examined at birth. Cells with pyknotic nuclei were found in layers 5, 4, and 3 of the cerebral isocortex, the habenula, and anterior medial nuclei of the thalamus. Brains taken at postnatal days 22 and 132 were reduced in overall size, and had a 20% to 30% reduction of cells at the vertex of the neocortex with up to 50% reduction in the thickness of the corpus callosum. A decrease in activity, an increase in fearfulness and/or decreased tendency to explore, reduced error scores on the Hebb-Williams maze, poor performance on the Maier elevated maze, and a lessened sensitivity to sound induced seizures were correlated with these anatomical changes. 21 references. (Author abstract modified)

252515 Yamamura, Henry I.; Manian, Albert A.; Snyder, Solomon H. Department of Pharmacology, Johns Hopkins University School of Medicine, Baltimore, MD 21205 **Muscarinic cholinergic receptor binding: influence of pimoide and chlorpromazine metabolites.** *Life Sciences (Oxford)*. 18(7):685-691, 1976.

The influence of pimoide upon muscarinic cholinergic receptor binding in rat brain and guinea pig ileum is assessed. The relative anticholinergic actions of phenothiazines and related drugs are thought to regulate the propensity of these agents to elicit extrapyramidal side effects, especially those resembling the symptoms of Parkinson's disease. Pimoide, differs from the butyrophenones in its relatively low incidence of extrapyramidal side effects. In assays of the binding of 3H-quinuclidinyl benzilate (QNB) to muscarinic sites, pimoide displays a high affinity for these cholinergic receptors, similar to drugs, such as thioridazine and chlorpromazine, which also have a low incidence of extrapyramidal side effects. This observation supports the notion that muscarinic anticholinergic actions can ameliorate the propensity of a drug to elicit extrapyramidal effects. The structure activity relationships of chlorpromazine metabolites in binding to muscarinic sites in the brain parallels some of their structure activity relationships as neuroleptic agents. 7-Hydroxychlorpromazine, which has been proposed as an antischizophrenic drug, binds to the muscarinic receptor with a potency similar to that of chlorpromazine itself, suggesting that the incidence of extrapyramidal side effects of 7-hydroxychlorpromazine might be similar to those of chlorpromazine. 20 references. (Author abstract modified)

252520 Pearl, J.; Spilker, B. A.; Woodward, W. A.; Bentley, R. G. Sterling-Winthrop Research Institute, Rensselaer, NY 12144 **Anticholinergic activity of antipsychotic drugs in relation to their extrapyramidal effects.** *Journal of Pharmacy and Pharmacology (London)*. 28(4):302-304, 1976.

Antipsychotic drugs are evaluated with two indices of anticholinergic activity: mydriasis in mice in vivo and antagonism of carbamylcholine-induced contractions of guinea pig tracheal strips in vitro. The drug's ranging from most to least potent as oral mydriatic agents, were mepazine, chlorpromazine, thioridazine, promazine and chlorpromazine. Trifluoperazine, pimoide and haloperidol were inactive. These results are consistent with the hypothesis that anticholinergic activity of antipsychotic drugs is inversely related to their propensity to produce extrapyramidal effects in man. In vitro results appear to predict the incidence of extrapyramidal effects less accurately than in vivo results. 16 references. (Author abstract modified)

06 METHODS DEVELOPMENT

243834 Faraj, Bahjat A. Emory University, Atlanta, GA 30322 **Radioimmunoassay of methylphenidate.** Final Report, NIMH Grant MH-26227, 1975. 8 p.

A specific, sensitive and simple assay for methylphenidate applicable to human plasma, urine, and other biological materials was developed. Radioimmunoassay was chosen. Antigens were prepared by conjugating methylphenidate to a macromolecule. An antibody was developed in rabbits, and synthesis was attained of high specific activity methylphenidate-3H. Immunochemical analysis was performed and antibody specificity evaluated. 2 references.

244462 Gajdzinska, Helena. Zaklad Medycyny Sadowej Sl. AM ul. 3 Maja 13, 41-800 Zabrze, Poland **Identification and**

quantification of chlorpromazine and its metabolites in acute experimental intoxication. / Identyfikacja i oznaczenia ilosciowe chlorpromazyny i jej metabolitow w ostrym zatruciu eksperymentalnym. *Archiwum Medycyny Sadowej i Kryminologii (Warszawa)*. 25(4):309-315, 1975.

Autopsies were performed on four rabbits poisoned orally with chlorpromazine (CPZ). Results reveal the presence of five CPZ metabolites as well as unchanged drug. Thin layer chromatography, paper chromatography, and ultraviolet spectrophotometry were used in the investigation. On the basis of earlier observations that phenothiazine derivatives show a high ion exchange affinity to the phenol-sulphone cationite instilled mechanically into the paper, this method was adjusted for quantitative determination of separated compounds. The absorbed substance formed on strips of cationite paper in zones with areas proportional to the amount of the determined substance. 14 references. (Journal abstract modified)

244636 Gauchy, C.; Tassin, J. P.; Glowinski, J.; Cherany, A. Groupe NB, INSERM U. 114, College de France, 11, place Marcelin Berthelot 75231, Paris cedex 5, France **Isolation and radioenzymic estimation of picogram quantities of dopamine and norepinephrine in biological samples.** *Journal of Neurochemistry (Oxford)*. 26(3):471-480, 1976.

A method was developed to measure small amounts of dopamine or norepinephrine in biological samples. It was based on the radioenzymic assay originally described by Engelman et al. (1968) and improved by other workers: dopamine and norepinephrine are O-methylated by catechol-O-methyltransferase in the presence of (3H)S-adenosylmethionine as labeled methyl donor. O-Methylated derivatives are extracted and estimated. The optimal conditions for the O-methylation and the extractions were determined. The most important improvement in the method consisted in the selective isolation of catecholamines on microcolumns of alumina under conditions that allowed their subsequent enzymic assay. The assay described can thus be used on any size of biological sample. The assay was not affected by the presence of various agents (tissue extracts cerebrospinal fluid (CSF) salts and particularly calcium and drugs) which were shown to interfere with the O-methylation process, and it allowed the measurement of quantities of dopamine and norepinephrine as low as 0.15 and 0.1 pmol respectively, whatever the origin of the sample (CSF superfusates, cerebral tissue). 13 references. (Author abstract)

244674 Jones, B. E.; Prada, J. A.; Martin, W. R. National Institute on Drug Abuse, Division of Research, Addiction Research Center, P.O. Box 12390, Lexington, KY 40511 **A method for bioassay of physical dependence on sedative drugs in dog.** *Psychopharmacology (Berlin)*. 47(1):7-15, 1976.

A method for an economical bioassay of physical dependence on sedatives is presented. Dogs maintained on sodium pentobarbital (200mg/kg/24 hr, i.v.) were given periodic graded reductions in maintenance dose, and subscales for measuring signs of abstinence were developed. Using these subscales the relative potencies were determined for sodium secobarbital and methaqualone. Sodium thiopental and methaqualone were assayed and found to be equipotent in reducing the signs of abstinence from sodium pentobarbital. The occurrence of convulsions, during periods of complete reduction of the maintenance drug, became less frequent the longer the dogs had been maintained on a constant dose of sodium pentobarbital. 20 references. (Author abstract)

245114 Ferrando, Raymond; Truhaut, Rene. Laboratoire de Nutrition et d'Alimentation, Ecole Nationale Veterinaire,

94701 Maisons Alfort, Val-de-Marne, France /Relay toxicity: a new approach to a methodology of evaluating the toxicity of additives to farm animal feed./ La toxicité de relais. nouvelle approche pour la méthodologie d'évaluation toxicologique des additifs aux aliments des animaux d'élevage. Bulletin de Médecine Légale et de Toxicologie Médicale (Lyon). 18(3):173-177, 1975.

The importance of evaluating the safety of animal feed additives is stressed, since the residues of additives in meat consumed by humans may be toxic. Instead of analyzing the effects of the additives, it is proposed that the food substances themselves be analyzed in long term studies of laboratory animals, using an approach called relay toxicity. 4 references.

245949 Weinryb, Ira. Department of Pharmacology, Squibb Institute for Medical Research, Princeton, NJ 08540 Biochemistry and the search for therapeutic agents. Perspectives in Biology and Medicine. 18(4):506-510, 1975.

Recent research of biochemists and biochemical pharmacologists is shown to have provided an abundance of biochemical models related to the treatment of disease. It is proposed that these in vitro models may be used to discover and refine potential therapeutic agents more rapidly and with less cost and compound required than in more traditional in vivo screening systems. In many cases equivalent predictive-ness for clinical utility are indicated. Catecholamine responsive adenylate cyclases can be used to identify selective beta-adrenergic agonist or antagonists. Dopamine responsive cyclases from mesolimbic or striatal brain tissues are useful in screening for antipsychotic substances. Biochemical test systems are discussed in detail, with examples of the possible utility of these systems in pharmacologic screening of new therapeutic agents. 22 references.

245971 Mormont, C. Clinique psychiatrique universitaire, Rue Saint-Laurent, 58, B-4000 Liege, Belgium /Logical analysis of the respective influence of three experimental variables by means of a diagram of L. Carroll. Application of this method to a clinical trial of two forms of Noveril./ Analyse logique de l'influence respective de trois variables expérimentales grâce à un diagramme de L. Carroll. Application de cette méthode à un essai clinique de deux formes de Noveril. Acta Psychiatrica Belgica (Bruxelles). 75(1):93-105, 1975.

The analysis of data gathered in a double-blind randomized crossover clinical trial of dibenzepine was systematized based on a model used by Lewis Carroll to manipulate four proposition syllogisms. This organization is considered to have facilitated the interpretation and increased the clarity of the findings. It is felt that Carroll's model could be easily adapted to many similar situations. 3 references. (Author abstract modified)

247846 Wagner, John G.; Weidler, Donald J.; Lin, Yi-Jong. College of Pharmacy, University of Michigan, Ann Arbor, MI 48104 New method for detecting and quantitating pharmacokinetic drug-drug interactions applied to ethanol-propranolol. Research Communications in Chemical Pathology and Pharmacology. 13(1):9-18, 1976.

A novel method for detecting and quantitating pharmacokinetic drug/drug interactions is described. The method involves perturbation of an existing steady state whole blood (or plasma) concentration of one drug by the other drug. The method would allow differentiation of pharmacokinetic drug interactions from pharmacologic interaction. It is shown that a bolus intravenous injection of propranolol reduced a steady

state arterial blood concentration of ethyl alcohol by 26% in the cat. 9 references. (Author abstract)

248290 Costall, Brenda; Naylor, Robert J. Postgraduate School of Studies in Pharmacology, University of Bradford, Bradford, Yorkshire, England Antagonism of the hyperactivity induced by dopamine applied intracerebrally to the nucleus accumbens septi by typical neuroleptics and by clozapine, sulphiride and thioridazine. European Journal of Pharmacology (Amsterdam). 35(1):161-168, 1976.

Dopamine administered intracerebrally to the nucleus accumbens septi is shown to induce a dose dependent hyperactivity in rats following pretreatment with nialamide. This effect was optimum following the injection of 50micrograms of dopamine. The hyperactivity induced by this dose of dopamine was inhibited by the i.p. injection of both the typical neuroleptic agents haloperidol, fluphenazine, pimozide and clothiapine (0.05 to 0.5mg/kg i.p.), and the atypical neuroleptics clozapine, sulphiride and thioridazine (0.5to 20 mg/kg i.p.)although, generally, the doses required of the latter were in the order of 20 to 100 times those of the typical agents to produce an equivalent effect. In contrast, cataleptic doses of metoclopramide (10 to 30mg/kg i.p.)failed to reduce the dopamine induced hyperactivity: aceperone and propranolol were similarly ineffective. However, inhibition of hyperactivity was recorded following the peripheral administration of the antimanic drug IB503. It is suggested that the ability of a drug to antagonize the hyperactivity induced by the injection of dopamine into the nucleus accumbens septi may be of value in the detection of antipsychotic activity. 22 references. (Author abstract)

249004 Altshuler, Harold; Weaver, Sydney; Phillips, Paul. Baylor College of Medicine, 1200 Moursund Avenue, Texas Medical Center, Houston, TX 77025 Intragastric self-administration of psychoactive drugs by the rhesus monkey. Life Sciences (Oxford). 17(6):883-890, 1975.

A new technique allowing intragastric self-administration of drugs by subhuman primates is described and assessed. It is reported that 11 of the 15 opportunities for animals to initiate self-administration resulted in the acquisition of the behavior. The drugs studied were pentobarbital sodium, ethanol, d-amphetamine sulfate, and methadone hydrochloride. The acquisition of ethanol self-administration yields relatively predictable patterns of drug intake -- commonly, alternating epochs of high and low drug intake. The cyclical pattern is similar to the patterns of oral intake of many drugs by the human drug abuser. Because of this similarity and several other features of the model, it is concluded that the intragastric self-administration model in the subhuman primate provides a useful method to study drugs abused orally by man. 13 references. (Author abstract modified)

249241 Albertson, T. E.; Stark L. G.; McCormack, C. Department of Pharmacology, University of California at Davis, Davis, CA 95616 Electrically induced hippocampal and cortical seizures and their effects on operant behavior. Pharmacologist. 17(2):178, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study was presented detailing the use of a new model for the investigation of potential anticonvulsant drugs and their effects on operant behavior. Food deprived, free moving rats bearing chronically implanted electrodes were operantly trained (FR-20). The effects of hippocampal and cortical electrically induced seizures while the animals were bar-pressing were studied, measuring the clinical

severity of the seizures produced, the latency to regain stable behavior (bar, pressing), the latency to regain stable EEG, the type of behavior once regained (rate compared to pre-seizure rate) and the length of epileptiform seizure activity. Most animals were found to regain behavior within the 30 min session. There was no significant difference in latency to regain behavior between the two experimental groups nor in time to regain stable EEG. Cortical seizures, however, lasted significantly longer (p less than .025) and were more severe (p less than .05). This model offers new measures for the behavioral quantification of pre-seizure and post-seizure effectiveness of anticonvulsant drugs. (Author abstract modified)

249305 Robinson, S. E.; Sulser, F. Vanderbilt University, School of Medicine, Nashville, TN 37232 **Effect of metaclopramide on limbic noradrenergic and striatal and limbic dopaminergic mechanisms.** *Pharmacologist* 17(2):257, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, August 1975 at the University of California, Davis, a study was presented which examined the effect of the antiemetic metaclopramide on limbic noradrenergic and striatal and limbic dopaminergic mechanisms. Metadopramide (M) shares with antipsychotic neuroleptic drugs the ability to block stereotyped behavior elicited by amphetamine. Since M can produce extrapyramidal symptoms in man but is not a useful antipsychotic agent, it was of interest to compare its effect with that of clinically effective antipsychotics on the norepinephrine (NE) sensitive cyclic AMP generating system in the limbic forebrain (LF) and on dopamine (DA) blockade in the striatum (ST) and LF. NE (50 μ M) caused a 5fold to 8fold increase of the basal level of cyclic AMP (25 \pm or - 1 picomoles/mg protein). While equimolar concentrations of clinically effective antipsychotic drugs (e.g. chlorpromazine, thioridazine, haloperidol) blocked this particular NE response by 60 to 70%, an equimolar concentration of M caused only slight inhibition. Like antipsychotic neuroleptics, however, M elicited a marked elevation in the concentration of HVA in both ST and LF 1 hr following the i.p. administration of the drug in doses that blocked d-amphetamine-induced stereotyped activity. Since the increase in HVA is most likely the consequence of DA receptor blockade, these studies suggest that M may provide a tool to delineate the role of DA vs. NE in the antipsychotic action of neuroleptics. (Author abstract modified)

250071 Klemm, W. R. Department of Biology, Texas A&M University, College Station, TX 77843 **Use of the immobility reflex ("animal hypnosis") in neuropharmacological studies.** *Pharmacology, Biochemistry and Behavior* 4(1):85-94, 1976.

The immobility reflex (IR), a reversible, involuntary, immobility response in certain species is advocated as a uniquely useful assay system for testing of psychoactive drugs. One potential area of application is that measures of IR duration or arousal threshold serve to screen drugs to help establish drug classification, relative potency, and degree of extrapyramidal side-effects. Drugs can also be tested for their neural target sites and modes of action by recording electrographic responses in various brain areas during IR. Electrographic activity (EEG, averaged evoked responses, multiple unit activity) is relatively stable, artifact free, and less influenced by behavioral feedback and other variables that are problems with alternative experimental preparations. The reversibility of the IR offers the advantages of chronic studies (evaluation of long-term effects, replication of results, and dose response testing in which each animal can serve as his own control). Results from both areas of application would ultimately need

cross checking by other methods to rule out interactions of IR and the independent variables being tested. Further possible interactions in long-term studies include potential interactions between the degree of tolerance developed to repeated IR trials and to repeated drug administration. 44 references. (Author abstract)

250073 Moore, Mitchell S.; Tychem, R. Lawrence; Thompson, Donald M. Department of Pharmacology, Georgetown University, School of Medicine, Washington, DC 20007 **Extinction-induced mirror responding as a baseline for studying drug effects on aggression.** *Pharmacology, Biochemistry, and Behavior* 4(1):99-102, 1976.

A study to evaluate extinction induced mirror responding as a baseline for studying drug effects on aggression is reported. Pigeons worked individually in a chamber containing a response key and a mirror. Responding on a key was controlled by a multiple schedule in which a brief period of continuous food reinforcement alternated with a 5 min period of extinction. Under baseline conditions, aggressive behavior (responding on the mirror) occurred at the onset of each extinction period. After 10 saline control sessions, 5mg/kg of chlordiazepoxide was injected IM 30 min before each session for 60 daily sessions. The drug initially produced a marked decrease in aggressive behavior but had little or no effect on keypecking. The aggressive behavior generally remained suppressed during the chronic drug regimen and returned to control levels when the drug was withdrawn. It is concluded that the technique of extinction induced mirror responding in pigeons provides a stable, sensitive and recoverable baseline for objectively assessing selective drug effects on aggression. 20 references. (Author abstract modified)

250332 Chemburkar, P. B.; Smyth, R. D.; Buchler, J. D.; Shah, P. B.; Joslin, R. S.; Polk, A.; Reavey-Cantwell, N. H. Wyeth Laboratories, Radnor, PA 19087 **Correlation between dissolution characteristics and absorption of methaqualone from solid dosage forms.** *Journal of Pharmaceutical Sciences* 65(4):529-533, 1976.

A study was conducted to develop a suitable in vitro dissolution technique that correlates with both newly prepared and aged methaqualone formulations. A methaqualone tablet in two strengths, 150 and 300mg, was developed. The dissolution rate of an experimental formulation in pH 7.0 phosphate buffer, measured by the resin flask method, was shown to correlate with bioavailability in humans. The dissolution rate criterion was used to develop the final tablet formulation. Bioavailability of this formulation in two strengths was compared with a commercial capsule formulation and a slowly dissolving tablet formulation. Correlation between dissolution rate and bioavailability was shown in freshly prepared methaqualone table formulations. Bioavailability of tablets under accelerated stability testing conditions remained unaltered, whereas the dissolution rates in pH 7 phosphate buffer decreased, using the resin flask method. A rotating flask method was developed, and dissolution in 0.1N HCl at 2rpm correlated with the bioavailability of both new and aged tablet formulations; it is concluded that dissolution studies using the rotating flask method are likely to give the best correlation with bioavailability. 13 references. (Author abstract modified)

251777 Kaul, Pushkar N.; Whitfield, Lloyd R.; Clark, Mervin L. 625 Elm Avenue, Norman, OK 73069 **Chlorpromazine metabolism VII: new quantitative fluorometric determination of chlorpromazine and its sulfoxide.** *Journal of Pharmaceutical Sciences* 65(5):689-694, 1976.

A new, sensitive assay is described for chlorpromazine and/or its sulfoxide. The method is based on reacting the tertiary amine base with 9-bromomethylacridine to form a quaternary compound which, on photolysis, yields highly fluorescent products that are determinable fluorometrically. The procedural steps were standardized, and an optimum assay procedure was developed. The method shows a less than 3% coefficient of variation when applied directly to chlorpromazine samples and is capable of determining 15 to 20ng of the drug. The method is readily adaptable to clinical and bioavailability studies. 16 references. (Author abstract)

CLINICAL PSYCHOPHARMACOLOGY

07 EARLY CLINICAL DRUG TRIALS

244189 Jacobsson, Lars; von Knorring, Lars. Dept. of Psychiatry, University of Umea, S-901 85 Umea, Sweden /Clinical experiences with a new antidepressant, ICI-58.834./ Klinische Erfahrungen mit einem neuen Antidepressivum ICI 58.834. Psychiatrie, Neurologie und Medizinische Psychologie (Leipzig). 28(2):114-119, 1976.

In an open study, 17 patients with depressive disorders, five patients with unipolar affective psychosis, nine patients with reactive neurotic depression, and three patients with depression were treated with a new antidepressant, ICI-58.834 (Vivalan). Only nine patients completed the trial. The frequency of side-effects, especially nausea and vomiting, was high, which will probably limit the clinical use of the drug. Of the patients who completed the trial, one recovered and four improved. It is concluded that the drug's antidepressive effect is questionable and must be tested in future studies. 8 references. (Journal abstract modified)

246309 Nakazawa, Yoichi; Kotorii, Makoto; Ohshima, Masachika; Horikawa, Shuichi; Tachibana, Hisayuki. Neuropsychiatry Dept., School of Medicine, Kurume Univ., Japan Effects of thienodiazepine derivatives on human sleep as compared to those of benzodiazepine derivatives. Psychopharmacologia (Berlin). 44(2):165-171, 1975.

The effects of new thienodiazepine derivatives, such as clotiazepam and Y-7131, on normal human sleep are investigated on five subjects and compared to those of benzodiazepine derivatives, such as diazepam and nitrazepam. Results show that REM sleep was significantly decreased only with 2mg of Y-7131 and rebound elevation of REM sleep did not follow in recovery 1 and 2 nights. By using partial differential REM deprivation, no rebound elevation of REM sleep was noted in recovery 2 night following 2mg of Y-7131 medication. REM sleep was not suppressed with 15mg of clotiazepam, 6mg of diazepam, and 10mg of nitrazepam when compared to the baseline night. With regard to NREM sleep, stage 2 was significantly increased with 15mg of clotiazepam and 10mg of nitrazepam, but stage SWS was significantly decreased with 10mg of nitrazepam. 28 references. (Author abstract)

247481 Simpson, George M.; Zoubok, Boris; Lee, J. Hillary. Research Institute, Rockland Psychiatric Center, Orangeburg, NY 10962 An early clinical and toxicity trial of EX 11-582A in chronic schizophrenia. Current Therapeutic Research. 19(1):87-93, 1976.

Ten chronic hospitalized schizophrenic patients were given EX 11-582A in dosages from 10 to 200mg daily for 12 weeks. The patients' clinical condition deteriorated during the initial placebo baseline and although the global means increased a little during EX11-582A administration, this reflected more a hold effect rather than real improvement except in two patients who showed improvement in psychotic symptoms. In the group as a whole, psychotic symptoms (hallucinations, unusual thought content and blunted effect) worsened significantly over the trial. Side-effects consisted of moderate to severe sedation to which the patients did not accommodate, and mild tremor and tachycardia. There was no evidence of extrapyramidal signs. EX 11-582A produced a small increase in pulse rate, a slight increase in lying blood pressures and no

EKG, eye or laboratory abnormalities. Tardive dyskinesia symptoms decreased with EX 11-582A administration and increased during the postdrug phase. In conclusion, EX 11-582A had little antipsychotic activity, though in one or two individuals activity was certainly present. The upsurge in psychotic behavior and tardive dyskinesia on withdrawal of the drug was noteworthy. 5 references. (Author abstract)

247877 Heiman, Michael F.; Schwabach, Gary; Tupin, Joe. Dept. of Psychiatry, University of California, Davis School of Medicine at San Joaquin Mental Health Clinic, Stockton, CA 95202 Liquid lithium vs. solid lithium: an open, cross-over, pilot study comparing oral preparations. Diseases of the Nervous System. 37(1):9-11, 1976.

Possible advantages of a liquid lithium preparation were investigated in an open, crossover pilot study comparing solid (capsule or tablet) with liquid lithium salt preparations in terms of obtained blood levels and side effects for a nonmanic-depressive prison population. Parameters of serum levels as a verification of absorption and side effects of solid lithium salts and liquid lithium preparations were compared in 15 Ss studied for six weeks. Results provide strong support for the theory that liquid lithium has neither greater nor more severe side effects than solid lithium preparations; there was, however, a recurrence of some mild gastric symptoms in subjects when they were switched to liquid lithium. Results further indicate that therapeutic serum lithium levels can be achieved with liquid lithium doses of 5mg equals 300mg solid, and that lithium citrate is a potentially useful alternative preparation for patients who cannot tolerate other lithium salts. 11 references.

249260 Lemberger, Louis; Rowe, Howard. Lilly Laboratory for Clinical Research, Indianapolis, IN The clinical pharmacology of Lilly compound 109514 in normal volunteers. Pharmacologist. 17(2):210, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study examining the clinical pharmacology of Lilly compound 109514 was presented. Lilly Compound 109514 is a potential antianxiety drug. Administration of 109514 in single doses of 1.0 to 5.0mg to normal volunteers resulted in dose related pharmacologic effects. One and 2.5mg of 109514 produced relaxant and sedative effects in all subjects. No euphoria, dry mouth, tachycardia or postural hypotension was seen after 1mg, minimal effects were seen after 2.5mg, and marked effects were seen after 5mg. Effects were evident within 60 to 90 min and persisted for 8 to 12 hrs. In contrast to related compounds, 109514 produced no significant tachycardia. There were no changes in supine blood pressure, however marked postural hypotension occurred after the 5mg dose. The administration of 109514 at doses of 1mg of or 2mg b.i.d. for 7 days resulted in symptoms (euphoria and dry mouth) during the first 2 to 3 days of drug. Thereafter, however, tolerance developed to these effects with no apparent decrease in the relaxant effects. Subjects challenged with a single 5mg dose of 109514 showed a 66% reduction in symptoms and signs after the 7 day drug period when compared to the administration of this same dose after one week of placebo. (Author abstract modified)

249622 Karniol, Isaac G.; Shirakawa, Itire; Takahashi, Reinaldo N.; Knobdl, Elias; Musty, Richard E. Departments of

Psychobiology, Escola Paulista de Medicina, R. Boucatu, 862, 1a, Sao Paulo 04023, Brazil Effects of delta 9-tetrahydrocannabinol and cannabinal in man. *Pharmacology (Basel)*. 13(6):502-512, 1975.

The interaction of delta 9-tetrahydrocannabinol (delta 9-THC) and cannabinal (CBN) was studied in man. Five male volunteers were given placebo, 50mg CB, 25mg delta 9-THC, 12.5mg delta 9-THC + 25mg CBN, 25mg delta 9-THC + 50mg CBN (orally). Administrations were spaced one week apart. With physiological measures, delta 9-THC produced an increase in heart rate while CBN did not. When combined, no change of the delta 9-THC effect occurred. No changes occurred on the electrocardiogram, blood pressure, or body temperature. With psychophysical measures no changes occurred in pain thresholds or skin sensitivity as a function of drug treatment. In time estimates of the passage of one minute, delta 9-THC alone produced underestimates of the passage of one minute and CBN alone had no effect. In combination the two drugs had a tendency to produce significant overestimates and underestimates of the passage of one minute. On a 66 item adjective pair drug, reaction scale, the volunteers reported feeling drugged, drunk, dizzy, and drowsy under the delta 9-THC condition, but not under the CBN condition. With combined drug treatment, volunteers reported feeling more drugged, drunk, dizzy, and drowsy than under the delta 9-THC condition alone. None of the drug treatments produced significant changes on other items which included items on perception, emotion, cognition and sociability. It appears that CBN increases the effect of delta 9-THC on the some aspects of physiological and psychological processes, but that these effects are small and cannot account for the greater potency which has been reported when plant material is used. 36 references. (Author abstract)

250422 Dahl, Svein G. Institute of Pharmacology, University of Oslo, P. O. Box 1057, Blindern, Oslo 3, Norway Pharmacokinetics of methotrimeprazine after single and multiple doses. *Clinical Pharmacology and Therapeutics*. 19(4):435-442, 1976.

A study was undertaken in order to obtain more complete information on the pharmacokinetics of methotrimeprazine in man, and as an attempt to discover the reason for the apparently high plasma levels of the sulfoxide. Concentrations of methotrimeprazine and a metabolite, methotrimeprazine sulfoxide, were measured in plasma after a single intramuscular dose and after single and multiple oral doses of methotrimeprazine. The highest plasma concentrations of methotrimeprazine were found 30 to 90 min after intramuscular injection, and 1 to 3 hr after oral administration. On the average 50% of the orally administered drug reached the general circulation as unchanged methotrimeprazine. The apparent volume of distribution was 23 to 42L/kg bodyweight, and the biologic half-life, 15 to 30 hr. The sulfoxide could not be traced in plasma after a 25mg intramuscular dose, but was found in higher plasma concentrations than the unmetabolized drug after single and multiple oral doses. This could be due to oxidation of the drug either in the gastrointestinal lumen or in the intestinal wall, or during its first passage through the liver. The apparent half-life of the sulfoxide was on average 30% shorter than the half-life of methotrimeprazine. 19 references. (Author abstract modified)

250476 Smeraldi, E.; Scorza-Smeraldi, R. Department of Psychiatry, Biologial Psychiatry Research Unit, University of Milan Medical School, 20122, Milan, Italy Interference between anti-HLA antibodies and chlorpromazine. *Nature (London)*. 260(5551):532-533, 1976.

Results of tests conducted to determine whether chlorpromazine, dopamine, and noradrenaline interfere with the specific binding of anti-HLA antibodies in man are presented. No difference was found between the cytotoxic titres of antisera absorbed by control lymphocytes and by lymphocytes preincubated with drugs, except for the anti-HLA-A1 sera M1 P42 and Morrison when tested with HLA-A1 positive cells. The possibility is suggested that beta-adrenergic receptors and HLA antigens descend from a single precursor and that HLA-A1 is the antigen which is less divergent from this common original structure and from the cell beta-adrenergic receptor than the other HLA specificities. 11 references.

250932 Peiris, J. B.; Boralessa, H.; Lionel, N. D. W. Neurology Department, General Hospital, Colombo, Ceylon Clonazepam in the treatment of choreiform activity. *Medical Journal of Australia (Sydney)*. 1(8):225-227, 1976.

In a limited study, clonazepam, a new benzodiazepine derivative, has been found to be effective in suppressing choreiform movements in three patients with Huntington's chorea, three patients with nonfamilial chorea, and in one patient with senile chorea. In two patients with chorea of doubtful etiology, the response was not very satisfactory. A simple method was used to assess objectively the effect on choreiform movements. The effective dose varied from 3.5 to 5.5mg a day. The drug was well tolerated by most of the patients. It is noted that there is no evidence at present that it affects monoamine oxidase activity in the brain in the same way as thiopropazate, haloperidol, and tetrabenzine. 2 references. (Author abstract modified)

250943 Gunne, Lars-M.; Antonijevic, S.; Jonsson, J. Psychiatric Research Centre, 750, 17 Uppsala 17, Sweden Effect of fenfluramine on steady state plasma levels of amitriptyline (abstract). *Postgraduate Medical Journal (Oxford)*. 51(1):117, 1975.

At a symposium organized by the Servier Research Institute held in Marbella, Spain March 1974, a paper was presented in which the possible metabolic interaction of fenfluramine and amitriptyline was examined as an explanation of mood changes reported in patients when fenfluramine is withdrawn. Three subjects received a gradually increasing dose of amitriptyline ranging from 10mg to 50mg three times daily. After three weeks, when the plasma amitriptyline levels had reached a steady state, fenfluramine was added in a slowly increasing dosage to a maximum of 60mg daily and maintained for a period of 19 days. Fenfluramine was then withdrawn in stepwise dosage and plasma amitriptyline levels monitored for a further two weeks. Results indicate that in all three patients, plasma amitriptyline levels rose above the steady state level during fenfluramine administration and did not return to base line levels until one to two weeks after fenfluramine withdrawal. Nortriptyline levels were estimated in two patients, both of whom showed a considerable increase from steady state levels, returning to base line within two weeks of fenfluramine withdrawal. Results suggest that there is a metabolic interaction between fenfluramine and amitriptyline which warrants further investigation. (Author abstract modified)

250945 Holmstrand, Jan; Jonsson, John. Psychiatric Research Center, University of Uppsala, Ulleraker Hospital, 750 17 Uppsala 17, Sweden Subjective effects of two anorexic agents -- fenfluramine and AN 448 in normal subjects. *Postgraduate Medical Journal (Oxford)*. 51(1):183-186, 1975.

In a paper presented at a symposium organized by the Service Research Institute held in Marbella, Spain March 1974, results of a double-blind crossover trial examining the subjective autonomic effects of fenfluramine and AN 448 (Sandoz AG) on nine healthy, normal weight subjects were presented. Fenfluramine (14mg) and AN 448 (1mg) were given twice daily for three weeks. A self-rating scale for appetite, ability to concentrate, mood and quality of sleep was filled out daily. Neither fenfluramine (80mg/day) or AN 448 (2mg/day) showed mood elevating properties. Results indicate that during the first week of medication fenfluramine caused a decrease in ability to concentrate; a decrease in this factor was also seen after withdrawal of AN 448 and fenfluramine. Mood was lowered during the first week after fenfluramine, and appetite was reduced by fenfluramine during the first week of medication. AN 448 appeared to disturb sleep during the first week of medication. None of the drugs were found to lower body weight significantly. However, AN 448 was found to increase heart rate and pupillary diameter, whereas fenfluramine decreased blood pressure and heart rate. The critical point of this investigation appears to be the fairly high dropout rate, disturbances in ability to concentrate, and side-effects such as feelings of derealization and apathy during the first fenfluramine week. 5 references.

251006 Pines, A.; Nandi, A. R.; Rahman, M.; Raafat, H.; Rooney, J. F. F. East Herts Hospital, Hertford, England A clinical trial of temazepam, a sleep inducer, in hospital patients. *Journal of International Medical Research* (Northampton). 4(2):132-137, 1976.

Results of a clinical trial in which temazepam, a common metabolite of diazepam and oxazepam, was evaluated as a sleep inducer are reported. A dose of 20mg, in a Scherer capsule formulation, was compared with 200mg of amylobarbitone sodium in a between patients, randomized study. Patient and staff assessments were used. No statistically significant difference as to onset of sleep, duration or quality of sleep or morning drowsiness was found using the patients' assessments. The staff recorded significantly less daytime dozing and morning hangover in patients receiving temazepam. Side-effects were mild and confined mainly to drowsiness on awakening. Two patients, both on amylobarbitone sodium, withdrew from the study because of increasing confusion. 14 references. (Author abstract modified)

251649 Lieberman, Abraham; Zolfaghari, Medhi; Boal, Dinkar; Hassouri, Hassan; Vogel, Barry; Battista, Arthur; Fuxe, Kjell; Goldstein, Menek. 566 First Avenue, New York, NY 10016 The antiparkinsonian efficacy of bromocriptine. *Neurology*. 26(5):405-409, 1976.

The antiparkinsonian activity of bromocriptine, a presumed dopaminergic receptor agonist, was investigated in monkeys with surgically induced tremor and in a group of parkinsonian patients. A single administration of bromocriptine resulted in a dose dependent relief of tremor in monkeys. Repeated administration enhanced this effect. Only mild abnormal involuntary movements were observed and only after repeated administration. Eleven patients with Parkinson's disease were treated with bromocriptine (mean dose, 26.4mg a day). Clinically obvious improvement was noted in one or more of the cardinal signs of the disease in six patients (responders). No obvious improvement in any of the cardinal signs was noted in the remaining five patients (nonresponders). Clinically, the responders were older more severely affected and had been on a higher dose of levodopa. However, they had had the disease for a shorter period. It is suggested that failure to respond to

bromocriptine may be related to a decrease in the sensitivity of postsynaptic dopaminergic receptors. 12 references. (Author abstract)

251651 Feigenson, Joel S.; Sweet, Richard D.; McDowell, Fletcher H. Burke Rehabilitation Center, White Plains, NY 10605 Piribedil: its synergistic effect in multidrug regimens for parkinsonism. *Neurology*. 26(5):430-433, 1976.

Piribedil, a dopamine agonist, was administered to 13 patients with long standing Parkinson's disease whose major symptoms were not well controlled on levodopa, anticholinergics, alpha-methyl dopa, amantadine, or a combination of these agents. Twelve of the thirteen clearly benefited from the addition of Piribedil, although side-effects precluded long-term use in two cases. Beneficial results were obtained by using a combination of Piribedil, levodopa, and anticholinergic drugs. Side-effects (hallucinations, confusion, dyskinesias were frequent, but were usually reversible by lowering the dosage of levodopa or the accompanying anticholinergic medication. It is felt that the synergistic effect of Piribedil and other antiparkinsonian drugs emphasizes the need for careful titration of all available medications in difficult cases, and demonstrates the usefulness of dopamine receptor stimulators when drugs acting presynaptically have failed. 18 references. (Author abstract)

251719 Collins, P.; Sakalis, G.; Minn, F. L. Neuropsychopharmacology Research Unit, Department of Psychiatry, New York Univ. Medical Center, 550 First Ave., New York, NY 10016 Clinical response to a potential non-sedative anxiolytic. *Current Therapeutic Research*. 19(5):512-515, 1976.

To further explore the anxiolytic activity attributed to SQ 65,396 in a previous inpatient open study, 12 anxious volunteer subjects received SQ 65,396 (cartazolate), diazepam, and placebo in a double-blind crossover design. There was a trend in all the assessment scales for the patients to exhibit less anxiety on diazepam. This and other results are at variance with those obtained in the previous study. Possible reasons for this discrepancy are discussed. 6 references. (Author abstract modified)

252141 Regalado, R. G. Great Wyrley, Staffordshire, England Anafranil in the management of long-term pain: a preliminary report. *Journal of International Medical Research* (Northampton). 4(2):54-55, 1976.

In a paper presented at the symposium on psychotropic drugs and pain, Stratford-upon-Avon, England, a preliminary report on the efficacy of clomipramine in the management of patients with long-term locomotor system pain is given. Initial results indicate that the addition of low doses of clomipramine (10mg to 25mg) to the conventional analgesic therapy modifies the pain threshold of such patients and that, as a result, daily doses of analgesic may be reduced. (Author abstract modified)

252448 Varady, G.; Bolla, K.; Sebo, J. Psychiatric Care Center, Egyt Pharmacochemical Works, Budapest, Hungary The clinical evaluation of Grandaxin used in the treatment of outpatients (a multicentric study). *Therapia Hungarica* (Budapest). 23(4):153-158, 1975.

Results of the treatment of 325 outpatients with the minor tranquilizer Grandaxin are presented. Findings indicate that the anxiolytic drug is most beneficial in the treatment of minor psychiatric conditions accompanied by loss of physical and psychic energy, in vegetative dystonia in antialcoholic treatment, and in psychic disorders requiring psychotonic har-

monizing and energizing treatment. Good results were obtained in the treatment of involuntional pathologic changes in the aged; adaptability and sociability were enhanced. Side-effects such as drowsiness were not found to be present; only four patients developed gastrointestinal reactions, and one exhibited a cutaneous allergic response. The drug is cited as particularly applicable to functional clinical conditions in outpatient care. 25 references.

252449 Szobor, A. Department of Neurology, Robert Karoly Municipal Hospital, Budapest, Hungary Treatment of psychic disorders accompanying myasthenia gravis: (Grandaxin, a new, non-relaxant tranquilizer). *Therapia Hungarica* (Budapest). 23(4):159-163, 1975.

The importance of secondary psychopathologic conditions accompanying organic neurologic diseases, including myasthenia gravis myopathia, and the difficulties encountered in treatment are discussed. In a clinical study 39 myasthenia and 8 myopathia patients were treated with Grandaxin, a new Hungarian minor tranquilizer. The effect of the drug in myasthenia patients was compared by sequential analysis of the results obtained with combined Grandaxin/Valeriana (.02 phenobarbital and .10 extractum valerianae siccum) tablets. The examined drug proved to be a tranquilizer and thymoelectric agent of value. It has no significant toxic effects and no relaxant activity. For this reason it is suggested as the drug of choice in the treatment of psychopathologic changes of myasthenia in particular, and in the solution of psychological problems encountered during the patient's care. 17 references. (Author abstract modified)

253011 Pynnonen, S.; Sillanpaa, M.; Frey, H.; Iisalo, E. Department of Biomedicine, Division of Pharmacology, University of Turku, SF-20520 Turku, Finland Serum concentration of carbamazepine: comparison of Herrmann's spectrophotometric method and a new GLC method for the determination of carbamazepine. *Epilepsia* (Amsterdam). 17(1):67-72, 1976.

A specific direct gas chromatographic method to determine carbamazepine and, semiquantitatively, 10,11-epoxy carbamazepine in serum is described. The average recovery of carbamazepine is 98%, and the error on duplicate determination is plus or minus 4%. The method is compared with Herrmann's classic spectrophotometric method. In material of 103 patients the mean serum concentration of carbamazepine was 25.5 plus or minus 12.8 micromoles/l with GLC and 23.0 plus or minus 12.6 micromoles/l with spectrophotometry. The difference was highly significant. The blood sample volume is one tenth of that needed in spectrophotometry. 19 references. (Author abstract)

253053 Pecknold, J. C.; Ban, T. A.; Lehmann, H. E.; Stewart, J. A. Division of Psychopharmacology, Department of Psychiatry, McGill University, Montreal, Quebec, Canada /An introduction to systematic studies of trazodone./ An introduction to systematic studies. *Psychopharmacology Bulletin*. 12(2):40-41, 1976.

An introduction to systematic studies of the use of trazodone was presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada. Trazodone is the first triazolo-pyridine compound to be subjected to clinical psychopharmacological investigation. It has been shown that trazodone is not easily placed into any preordained scheme of psychoactive drugs, it inhibits conditioned avoidance responses at doses that do not influence unconditioned escape reactions and protects mice from amphetamine

toxicity. It lacks cataleptogenic properties, has weak hypothermic activity and does not inhibit stereotyped behavior. It has been found that trazodone is inactive in standard tests for antidepressant agents, is not an MAO inhibitor and lacks weak muscle relaxing action. Subsequent studies have been designed to elaborate the psychotherapeutic action of trazodone. 3 references.

253323 Vukovich, R. A.; Dreyfuss, J.; Schreiber, E. C.; Neiss, E. S. Department of Clinical Pharmacology, Squibb Institute for Medical Research, Princeton, NJ 08540 Absorption and excretion of a new antidepressive (SQ 10,996) in humans. *International Journal of Clinical Pharmacology and Biopharmacy* (Munich). 13(3):182-186, 1976.

The extent and kinetics of absorption and excretion of SQ 10,996, a new antidepressive is studied following oral administration in 3 normal male subjects. A single oral dose of 10mg of SQ 10,996-14C was absorbed slowly by the subjects with peak plasma concentrations achieved 6 hr after ingestion; the plasma half-life was about 38.5hr. On average 82.3% (plus or minus 3.5%) of the radioactivity present in the 2 hr plasma sample was bound to plasma proteins. These volunteers excreted an average of 31% and 52% of the dose in the urine and feces, respectively. All subjects excreted minor amounts of $^{14}\text{CO}_2$ in the expired air. No unchanged SQ 10,996-14C was found in the urine. Three unidentified metabolites were excreted in urine. SQ 10,996-14C was excreted in the feces only as unchanged drug, suggesting that the drug is incompletely absorbed. The volunteers tolerated the drug well and experienced no adverse effects. 2 references. (Author abstract modified)

08 DRUG TRIALS IN SCHIZOPHRENIA

243986 Nurowska, Krystyna; Paluba, Maria; Welbel, Leszek. I Klinika Psychiatryczna Instytutu Psychoneurologicznego, Al. Sobieskiego 1/9, 02-957 Warsaw, Poland /Effect of clozapine on the mental and physical state of patients./ Wplyw klozapiny na stan psychiczny i fizyczny chorych. *Psychiatria Polska* (Warszawa). 9(4):423-429, 1975.

Clozapine was given to 36 patients diagnosed as acute or chronic schizophrenics. The drug was administered over a 40 day period; the highest dosage given was 600mg/24 hours. The mental state of patients was evaluated according to the Brief Psychiatric Rating Scale (BPRS) Inventory. Definite improvement was noted in 39% of the cases, while favorable effects were observed in 83%. The drug had a particularly good effect on such symptoms as anxiety, emotional strain, and hallucinatory/delusional states. Delirium, convulsive seizures, acute allergic reaction, and pneumonia were among the more serious side-effects found in patients receiving the drug. The results indicate that this neuroleptic drug is especially effective in acute psychoses with motor stimulation and hallucinatory and delusional episodes. Anxiety reduction can be seen within 3 days of its administration. It is concluded that the drug should be used with care in patients with organic central nervous system damage, due to its strong anticholinergic effect. 9 references. (Journal abstract modified)

244049 Welbel, Leszek; Nurowska, Krystyna. I Klinika Psychiatryczna Instytutu Psychoneurologicznego, Al. Sobieskiego 1/9, 02-957 Warsaw, Poland /Course and results of treatment with three activating neuroleptic drugs./ Przebieg i wyniki leczenia trzema neuroleptykami aktywizujacymi. *Psychiatria Polska* (Warszawa). 9(6):613-620, 1975.

Schizophrenic patients were treated with thiothixene (36 cases), flupenthixol (68 cases), and oxypertine (25 cases). The control group consisted of 35 cases treated with trifluoroperazine. The dosage of drugs was individualized and the duration of treatment varied from 3-12 months. The results of treatment were evaluated according to a 40 point psychopathological symptom inventory and a 20 point inventory of side-effects. It was shown that all three of the drugs exhibited neuroleptic and activating action and could be of help in resocializing chronic schizophrenics. Thiothixene is indicated in cases where thought process disturbances are the dominant symptoms, flupenthixol in cases where lack of activity is predominant, and oxypertine in patients with predominant symptoms of emotional indifference. The highest incidence of side-effects was observed with thiothixene and the lowest with oxypertine. Flupenthixol produced side-effects typical primarily of anticholinergic neuroleptics. 44 references. (Journal abstract modified)

244050 Kanabus, Piotr; Krysa, Grazyna; Lewicka, Hanna; Matsumoto, Halina; Pietruszewska, Irena; Stencka, Krystyna; Zajackowska, Anna. Klinika Psychiatryczna AM, ul. Nowowiejska 27, 00-665 Warsaw, Poland /Urinary excretion of metabolites of chlorpromazine: clinico-chemical correlations./ Wydalanie metabolitow chlorpromazyny w moczu: korelacje kliniczno-chemiczne. *Psychiatria Polska (Warszawa)*. 9(6):621-627, 1975.

Excretion of chlorpromazine and its metabolites in urine was determined twice weekly in 10 schizophrenics undergoing a routine treatment with the drug. Two independent methods were used, both of which are specific in the sense that they detect the native drug together with a number of its metabolites. During the period of constant, maximal dosage (usually 600mg/day, p.o.), the excretion often changed. These changes in the pattern of excretion seemed to reflect frequent qualitative as well as quantitative changes in the composition of the urinary metabolites. Almost all clinical improvements and deteriorations coincided with specific patterns of excretion. Furthermore, it was evident that the overall pattern of excretion in patients who eventually improved was markedly different from that of patients in whom therapy was a failure. It is suggested that the in vivo metabolites of chlorpromazine may exert a considerable influence on the clinical effectiveness of the drug in schizophrenics, and that the double assay of the urinary metabolites may prove helpful in early forecasting of the final clinical efficacy of the drug. 6 references. (Journal abstract modified)

244188 König, Liesbeth; Lange, Ehrig. Neurologisch-Psychiatrische Klinik, Medizinischen Akademie "Carl Gustav Carus", DDR-8019 Dresden, Fetscherstrasse 74, Germany /Value and advantages of Orap in outpatient treatment of schizophrenic psychoses./ Bedeutung und Vorzüge des Orap in der ambulanten Dispensaire-Betreuung schizophrener Psychosen. *Psychiatrie, Neurologie und Medizinische Psychologie (Leipzig)*. 28(2):106-113, 1976.

The value and advantages of pimoide (Orap) for the outpatient care of schizophrenic psychoses are discussed. Clinical treatment with Orap-Janssen and Orap-Richter from 1968 to 1974 is reported. Excellent tolerance makes Orap particularly suitable for long-term maintenance therapy in schizophrenia. The evaluation is based on observations in 91 patients. 22 references. (Journal abstract modified)

244501 Simpson, George M.; Branchey, Marc H.; Lee, J. Hilary; Varga, Ervin. Rockland Research Institute, Orangeburg,

NY 10962 A two year trial of loxapine succinate in chronic psychotic patients. *Diseases of the Nervous System*. 37(5):305-308, 1976.

The long-term efficacy and safety of loxapine succinate were assessed in 31 chronic psychotic patients treated with this drug for one to 2 years. Loxapine succinate was found to be an effective treatment for chronic schizophrenia over a period of at least 2 years. Improvement, which occurred during the first 6 months of treatment, was maintained over the following 1.5 years. Unwanted effects were most frequent in the early months of treatment and decreased as the 2 year trial progressed. No specifically long-term side-effects were observed. The most frequent side-effects were mild to moderate extrapyramidal signs. Blood pressure decreased and pulse rate increased, while remaining within normal limits, and returned to normal or near normal levels during the second year of treatment. Weight increased steadily during the 2 years and dropped markedly during the 4 week postdrug period. No drug related abnormal laboratory findings were observed. It is concluded that loxapine succinate is a safe and effective maintenance treatment for chronic schizophrenia. 11 references. (Author abstract)

244528 Inanaga, Kazutoyo; Nakano, Tetsuo; Nagata, Toshiyasu; Tanaka, Masatoshi. Dept. of Neuropsychiatry, Kurume University School of Medicine, Kurume 830, Japan Effects of thyrotropin-releasing hormone in schizophrenia. *Kurume Medical Journal (Kurume)*. 22(3):159-168, 1975.

Thyrotropin releasing hormone (TRH) was administered to 62 schizophrenics for 14 days in conjunction with maintenance neuroleptic therapy. Patients included 32 males and 30 females who exhibited reduced spontaneity, abulia, apathy and autism as principal symptoms. Of the 68 patients treated, responses of 27 were termed excellent or good. Symptomatic aggravation resulted in six, and no symptomatic response was elicited in 10 cases. Facial expression, rapport and physical activity were among features that responded favorably to TRH. No substantial difference existed between effectiveness of the hormone and type of illness. Symptomatic aggravation was more frequent in females than males. Fair or better responses tended to be more frequent in patients institutionalized for more than 5 years than among those hospitalized for shorter periods. The effect of the hormone was seen within a week, and its effect lasted for a variable period. Adverse effects were seen in one case. 7 references. (Author abstract modified)

244587 Nava, V.; Nielsen, N. P. Ospedale Psichiatrico Provinciale di Como, Como, Italy /Peculiar clinicopharmacological properties of clozapine revealed in a group of chronic schizophrenics./ Peculiari proprietà clinico-farmacologiche della clozapina evidenziate in un gruppo di schizofrenici lungodegenti. *Rassegna di Studi Psichiatrici (Siena)*. 64(6):955-970, 1975.

The properties of clozapine were assessed by administering it to a group of 50 chronic schizophrenics for 4 months in mean doses of 100-200mg/day. Improvement in behavior was obtained in 78% of the cases. The drug's effects include an anti-tic effect and a sedative effect. The first phase of the drug's action included a disinhibiting effect, and the successive phase included a resocializing effect. Clozapine did not cause extrapyramidal side-effects, making it particularly suitable for chronic patients. In addition, it did not cause a passivity/inertia/depression type of syndrome which is often observed with long-acting substances. Its mechanism of action differs from that of other neuroleptics in that it does not par-

ticularly affect the release and metabolism of dopamine. The absence of side-effects of the extrapyramidal type may be due to the drug's marked affinity for muscarinic cholinergic receptors. 50 references. (Journal abstract modified)

244620 Vitorovic, Momcilo. Klinicna bolnisnica za psihiatrijo, Ljubljana, Yugoslavia /Five years of depot fluphenazine therapy./ Pet godina iskustva u primeni flufenazina -- depo terapije. Anali Zavoda za Mentalno Zdravlje (Beograd). 7(1):57-62, 1975.

The effectiveness of Moditen Depot (fluphenazine) therapy with patients at 261 Yugoslavian outpatient departments and 64 hospitals over a 5 year period is reported. Results indicate that: 1) depot fluphenazine is the best available means for obtaining long-term remission in discharged female schizophrenics; 2) it is not suitable for treating acute pathology, either at the usual 25mg/month or at a double dosage, unless undesirable mammoth dosages are applied; 3) it is fairly satisfactory in permanently hospitalized chronic schizophrenics and may be used with institutionalized schizophrenics in homes for the aged and hospitals for incurables; 4) even in the event of initial failure, repeated treatments are often successful; and 5) long-term therapy has not produced cases of permanent extrapyramidal lesions. It is recommended that the drug only be administered by a psychiatrist or by a specially trained physician. 5 references. (Journal abstract modified)

245014 Moyano, Carlos Zarate. Northwest Mental Health Center, Philadelphia, PA A double-blind comparison of Loxitane: loxapine succinate and trifluoperazine hydrochloride in chronic schizophrenic patients. Diseases of the Nervous System. 36(6):301-304, 1975.

A comparison of the therapeutic efficacy and safety of loxapine succinate (LOX) and trifluoperazine hydrochloride (TFP) in a controlled double-blind study with 49 chronic schizophrenic inpatients is reported. The data indicated that LOX in dosages ranging from 40 to 65 mg/day had demonstrable antipsychotic activity in 14 of 25 chronic schizophrenic patients, while TFP treatment in appropriate dosage showed a similar activity in 9 of 23 patients. Both LOX and TFP showed essentially the same profile and incidence of side-effects. Conclusion is drawn that Loxapine is an efficacious and essentially safe medication, suitable for the treatment of chronic schizophrenia. (Author abstract) 10 references.

245559 Strauss, Milton E. Department of Psychology, Johns Hopkins University, Baltimore, MD 21218 Strong meaning-response bias in schizophrenia. Journal of Abnormal Psychology. 84(3):295-298, 1975.

The generality among schizophrenics of the specific form of associative intrusion identified as an exaggerated strong meaning/response bias is examined. As hypothesized, only chronic schizophrenic patients differed significantly from psychiatrically normal prisoners used as subjects. Expected phenothiazine effects, however, were not observed. The use of drug free patients was considered vital to the meaningfulness of the test of schizophrenic psychological deficit. 12 references. (Author abstract modified)

245650 Cooper, Sam F.; Dugal, Robert; Albert, Jean-Marie; Bertrand, Michael. National Institute for Scientific Research, St-Jean-de-Dieu Hospital, Montreal, Quebec H1N 1Z0, Canada Penfluridol steady-state kinetics in psychiatric patients. Clinical Pharmacology and Therapeutics. 18(3):325-329, 1975.

A group of 22 hospitalized schizophrenic patients, participating in a large scale phase 2 double-blind dose effect study (30, 60, and 120mg weekly) of penfluridol, a new diphenylbutyl-piperidine neuroleptic, were maintained on a regular dosage regimen for 13 weeks. Several blood samples were taken during the last dosage interval. Results show that the peak concentration develops within 12 hr after the last dose. A rapid decline, probably due to tissue reequilibration, then occurs and is followed by a much slower falloff. Detectable concentrations 168 hr after administration are consistent with the long duration of action of the drug. Significant differences between doses occurred in plasma concentrations at all sampling times and in mean steady-state plasma concentrations. Wide differences in plasma concentrations were noted in patients receiving the same absolute dose, but a good relationship was defined between mean steady-state concentration and the dose expressed as mg per either kg of body weight or square meter of body surface area. 14 references. (Author abstract)

245841 Groves, James E.; Mandel, Michel R. no address The long-acting phenothiazines. Archives of General Psychiatry. 32(7):893-900, 1975.

The enanthate and decanoate esters of the phenothiazine fluphenazine are discussed as an effective treatment of the disordered behavior and thinking of schizophrenia. The decanoate preparation is not only slightly longer acting but also has a smaller incidence of side effects than the enanthate. The major adverse effect of these medications is the high frequency of extrapyramidal system disturbance. Since the 50% rate of failure of schizophrenic outpatients to take prescribed oral medications decreases treatment failure to about 20% with the use of long acting injectable phenothiazines, this route of administration is considered to offer an advantage in patient management particularly applicable to community mental health systems. Moreover, parenteral administration of long acting fluphenazine may be useful for patients who do not attain effective serum levels with medication taken orally because of metabolic or absorption difficulties. 153 references. (Author abstract modified)

245842 Cooper, Thomas B.; Simpson, George M.; Haher, E. Janet; Bergner, Per-Erik E. Rockland State Hospital, Research Center, Orangeburg, NY 10962 Butaperazine pharmacokinetics: effect of dosage regimen on steady state blood levels. Archives of General Psychiatry. 32(7):903-905, 1975.

An examination of the pharmacokinetics of a variety of drugs used in psychiatry is presented in order to determine the effects of variation in the time interval between drug administration on plasma levels of 10 chronic schizophrenic patients receiving butaperazine. Results show that a higher whole blood steady state drug plasma level was achieved when a patient was given medication three times a day compared to the same total daily dose once a day. In addition, evidence indicated possible enzyme induction by butaperazine in one patient. It is demonstrated that the general stochastic theory developed to investigate the pharmacokinetics of lithium carbonate in vivo has more general applicability in that it applies also to butaperazine and facilitates interpretation of findings (without blood level data) in one other drug study. 7 references. (Author abstract modified)

245863 Levin, Kenneth; Kolodny, Edwin; Blumer, Dietrich. Department of Psychiatry, Beth Israel Hospital, Boston, MA Case report of the McLean Hospital, Belmont, Massachusetts: LV--a patient with both a schizophrenic psychosis and a Parkinson-like illness. Psychiatric Opinion. 12(8):37-42, 1975.

A case history of a patient suffering from both a schizophrenic psychosis and a Parkinson type illness illustrates the masking of symptoms when these two diseases coexist, due to the introduction in recent years of levodopa therapy for Parkinsonism and phenothiazines and butyrophenones for schizophrenia. The 41 year old patient's symptomatology and responses to withdrawal and reintroduction of levodopa therapy suggested that she was suffering from a Parkinson type extrapyramidal disease as well as schizophrenia, raising the issue of the very complex relationship between the two classes of syndromes. Although the relationship can be described in terms of simple neurochemical reciprocity, it is considered far more complex than this model, which fails to account for the peculiar susceptibility of schizophrenic patients to Parkinsonism. The consideration of both antiParkinsonian and antipsychotic medications for use in these cases is recommended. 7 references.

245967 Frangos, E.; Christodoulides, H. Skoufa Street 64, Athens 144, Greece *Clinical observations on the treatment of tardive dyskinesia with haloperidol*. Acta Psychiatrica Belgica (Bruxelles). 75(1):19-32, 1975.

The clinical characteristics of the neurologic syndromes provoked by the neuroleptic drugs and most particularly the syndrome of tardive dyskinesia are reviewed as an introduction to the reportage of results obtained from the administration of haloperidol to 10 schizophrenic patients for 6 weeks. The administration of haloperidol was observed to reduce both the frequency and intensity of peristomal movement, as these dyskinetic phenomena were suppressed during the entire trial period. It is concluded that haloperidol can be useful in the management of tardive dyskinesia. 10 references. (Author abstract modified)

246186 Corbett, Lionel. Department of Psychiatry, University of Alabama, 1919 7th Ave. South, Birmingham, AL 35223 *Technique of fluphenazine decanoate therapy in acute schizophrenic illnesses*. Diseases of the Nervous System. 36(10):573-575, 1975.

The effectiveness of fluphenazine decanoate therapy in acute schizophrenic illness is investigated. Findings indicate that the drug can be safely used as the phenothiazine of first choice in the management of acute schizophrenia, either alone or in combination with other neuroleptics if necessary for additional sedation. Usually 2 to 5ccs/im are needed to effect remission. A high incidence of striatal side-effects are considered a major problem, but these are usually manageable. The advantages of this regimen are discussed. 17 references.

246314 Sakurai, Yukihiro; Nakahara, Tadahiko; Takahashi, Ryo. Department of Neuropsychiatry, Nagasaki Univ. School of Medicine, Nagasaki, 852, Japan *Prediction of response to chlorpromazine treatment in schizophrenics*. Psychopharmacologia (Berlin). 44(2):195-203, 1975.

A study conducted to determine whether there are relationships between blood levels of chlorpromazine (CPZ) or some of its metabolites and the clinical effectiveness of CPZ treatment is reported. A dose of 50mg CPZ was given to six untreated schizophrenic patients and eight healthy volunteers at 7:00 a.m. before breakfast. Blood samples were taken 3, 6, 9 and 24hrs after for the analyses of CPZ and its metabolites by gas chromatographic techniques. In the cases of schizophrenic patients, the CPZ treatment was continued. Serum drug levels were monitored and clinical response assessed. The drug levels in serum of another group of patients already under long-term treatment were also determined. Although wide interpatients

variations in serum drug levels after a single dose administration were observed, the CPZ level in the patients decreased faster than in the normal subjects. Patients showing high levels of the metabolites such as demethylated CPZ and CPZ sulfoxide after a single dose of CPZ tended to achieve poorer clinical improvement in CPZ therapy, agreeing with the results that poor responders to long-term CPZ treatment revealed relatively high levels of the metabolites of CPZ compared with CPZ level. Results indicate that the study of a single dose administration prior to initiating treatment with CPZ can be used to determine how an individual patient would respond to CPZ therapy and, therefore, is a valuable tool in the rational pharmacotherapy of schizophrenic patients. 20 references. (Author abstract modified)

246672 Klein, H. E.; Chandra, O.; Matussek, N. Nervenkl. der Universität, 8 München 2, Nussbaumstrasse 7, Germany *Therapeutic effect and plasma level of thioridazine (Melleril) in schizophrenic patients*. Therapeutische Wirkung und Plasmaspiegel von Thioridazin (Melleril) bei schizophrenen Patienten. Pharmakopsychiatrie Neuro-Psychopharmakologie (Stuttgart). 8(3):122-131, 1975.

The relationship between therapeutic effect and plasma level of thioridazine in schizophrenic patients with paranoid and hallucinatory symptoms is investigated. Plasma concentration was measured in 18 patients twice a week by a fluorometric method during a period of treatment lasting for an average of 27 days; psychopathological findings were recorded by means of the AMP system. A significant correlation was found both between dosage per kg bodyweight and plasma level, and between age and plasma level, but no connection with the sex of the patient could be demonstrated. A curvilinear correlation was observed to exist between plasma concentration and remission of symptoms. In the course of the trial, the plasma concentrations of thioridazine declined though the dosage was kept constant, indicating an increased metabolism of the drug brought about by enzyme induction. In two cases where previous liver damage could be assumed, the plasma concentrations were found to be above the average level. 28 references. (Journal abstract modified)

247480 Campbell, Magda; Small, Arthur M.; Collins, Patrick J.; Friedman, Eitan; David, Raphael; Genieser, Nancy. New York Univ. Medical Ctr., 550 First Ave., New York, NY 10016 *Levodopa and levoamphetamine: a crossover study in young schizophrenic children*. Current Therapeutic Research. 19(1):70-86, 1976.

The effects of levodopa and levoamphetamine were compared in a crossover, double-blind design. The subjects were 12 schizophrenic children 3 to 6.75 years of age. Optimal daily doses of levodopa ranged from 900 to 2,250 mg. per day, those of levoamphetamine from 3.5 to 42mg. per day. Although improvements on levodopa did not reach statistical significance, on the basis of nonblind ratings and informal reports of blind staff and parents it is concluded that levodopa merits further exploration in preschool psychotic children, chiefly because of its stimulating behavioral effects. Levoamphetamine yielded poor results. 42 references. (Author abstract)

247483 Pool, D.; Bloom, W.; Mielke, D. H.; Roniger, J. J., Jr.; Gallant, D. M. Dept. of Psychiatry and Neurology, Tulane Univ. School of Medicine, New Orleans, LA 70118 *A controlled evaluation of loxitane in seventy-five adolescent schizophrenic patients*. Current Therapeutic Research. 19(1):99-104, 1976.

A four week double-blind evaluation of loxapine, haloperidol, and placebo was conducted in 75 adolescent patients with a diagnosis of schizophrenia, acute or chronic with acute exacerbation. Side effects were relatively nonsignificant except for the incidence of extrapyramidal phenomena and somnolence. Both of the active antipsychotic agents showed clear superiority to placebo in relation to some of the important psychologic test items associated with schizophrenic symptomatology. Loxitane (loxapine) is concluded to be a relatively safe and efficacious compound for the treatment of adolescent schizophrenia as well as for acutely ill and chronically ill adult schizophrenic patients. 3 references. (Author abstract)

247968 Vianna Filho, U.; Versiani Caldeira, Marico V.; Romildo Bueno, J. Instituto de Psiquiatria da Universidade Federal do Rio de Janeiro, Av. Venceslau Brax 71, fundos Rio de Janeiro - 2000 - Brazil **The efficacy and safety of loxapine succinate in the treatment of schizophrenia: a comparative study with thiothixene.** *Current Therapeutic Research.* 18(3):476-490, 1975.

A multicenter double-blind trial compared the efficacy and safety of loxapine (10 to 20mg/day) and thiothixene (3 to 36mg/day) when administered orally, during a 12 to 13 week study with 50 hospitalized patients who had an established diagnosis of acute or chronic schizophrenia. Each treatment group was subdivided by duration of illness: less than 2 years, 2 to 10 years, and more than 10 years. Loxapine was statistically superior to thiothixene on many items and factors of the Brief Psychiatric Rating Scale and the Nurses' Observation Scale for Inpatient Evaluation in the below 2 years and the 2 to 10 years group. The reverse appeared true in the remaining group (more than 10 years). The most frequently reported symptoms for both the loxapine and thiothixene treatment groups (50% and 46% of patients, respectively) were extrapyramidal. The number of patients having dystonic, neurologic, cardiovascular and miscellaneous side-effects were about equally divided for both treatment groups. Akathisia, drowsiness, behavioral and anticholinergic effects occurred in twice as many patients taking loxapine as in those given thiothixene. However, it was not necessary to discontinue the drug in any of the patients that were treated with loxapine, due to the occurrence of side-effects. There was no evidence of abnormal laboratory results, cardiovascular, or ophthalmologic effects that were related to drug administration in either treatment group. The results are discussed in comparison with two previous trials with loxapine and thiothixene, and it is concluded that loxapine is a valid alternative in the treatment of schizophrenia. 10 references. (Journal abstract)

248976 Kramer, Milton; Roth, Thomas; Goldstein, Sidney; Ryan, Mary Sue; Blackwell, Barry. Veterans Administration Hospital, 3200 Vine, Cincinnati, OH 45220 **A double-blind evaluation of metiapine in hospitalized acute schizophrenics.** *Current Therapeutic Research.* 18(6):839-848, 1975.

An evaluation of the efficacy and safety of metiapine, a new benzodiazepine derivative, in the treatment of schizophrenia is presented. A double-blind study was conducted in 90 recently hospitalized schizophrenics who were randomized into three groups and treated with either metiapine, chlorpromazine, or a combination of butabarbital and atropine. It was found that metiapine and chlorpromazine in conservative doses were equally effective in achieving clinical improvement and both were more effective than the control drugs. Side effects, both subjective and extrapyramidal, were similar in type and frequency in the three groups but tended to be more intense in

the metiapine treated patients. Electrocardiographic changes, generally of a mild type, occurred in the same percentage of patients in both the chlorpromazine treated and metiapine treated groups. Weight gain was greatest in the metiapine treated group. No systematic effect on pulse was observed in any of the patients. Blood pressure was decreased in the chlorpromazine treated group. No evidence of clinically significant, drug related hepatic or renal impairment was observed. 7 references. (Author abstract modified)

249120 Inanaga, Kazutoyo; Ohshima, Masachika; Nagata, Toshiyasu; Yamauchi, Ikuro. Department of Neuropsychiatry, Kurume University School of Medicine, Kurume, Japan **Behavioral effects of L-dopa and thyrotropin-releasing hormone in schizophrenic patients: a preliminary report.** *Folia Psychiatrica et Neurologica Japonica (Tokyo).* 29(3):197-205, 1975.

The efficacy of L-Dopa (300 to 400mg daily) used concomitantly with conventional antipsychotic drugs was observed in four patients with chronic schizophrenia. In two of these four patients marked symptomatic improvement was observed, while in the other two symptoms remained unchanged. Symptoms that were found most responsive included disturbance of contact with others and emotional poverty. The two patients who responded favorably to L-Dopa plus antipsychotic drugs with marked symptom improvement were subsequently given thyrotropin releasing hormone (TRH), 4 to 8mg/day, for two to three weeks, the drug again being added to the preceding antipsychotic regimen. In a matter of one week symptomatic response became conspicuous; the patients were more communicative, richer in emotional response and more active than before. Another patient with schizophrenia of 4 years' duration was given 4mg per day of TRH for a 2 week period in combination with other antipsychotic medication. This therapy produced marked behavioral improvement. Because of worsening of symptoms occurring after discontinuance of TRH, L-Dopa, 300mg daily, was used. This therapy also resulted in behavioral improvement. The therapeutic trials in these five schizophrenics suggest that L-Dopa and TRH are observed to have something in common in their mechanism of action on schizophrenic reactions. The common feature is presumed to be the promotion of the metabolism of catecholamines, especially noradrenaline. 11 references. (Author abstract modified)

249121 Takahashi, Saburo; Yamane, Hideo; Tani, Naosuke. Department of Psychiatry and Neurology, Kyoto Prefectural University of Medicine, Kyoto, Japan **Reduction of blood platelet monoamine oxidase activity in schizophrenic patients on phenothiazines.** *Folia Psychiatrica et Neurologica Japonica (Tokyo).* 29(3):207-214, 1975.

A newly developed assay for monoamine oxidase (MAO) activity in blood platelets (serotonin used as substrate) was applied for the measurement of the enzyme activity in 76 schizophrenic patients. No significant reduction was found in the blood platelet MAO activity in a group of 33 untreated schizophrenic patients, as compared to that in the normal controls. Male patients were revealed to have lower enzyme activity than females in the schizophrenic group, as in the normal subjects. Treatment with phenothiazines caused significant reduction of blood platelet MAO activity, while platelet serotonin content and platelet count appeared not to be affected by the drug treatment. It is suggested that blood platelet MAO activity may be related to hormonal factors but not to psychiatric diagnosis of schizophrenia or to a constitution liable to schizophrenic illnesses. 17 references. (Author abstract)

251119 Axelsson, S.; Jonsson, S.; Nordgren, L. Histologiska Institutionen, Biskopsgatan 5, S-223 62 Lund, Sweden **Cerebrospinal fluid levels of chlorpromazine and its metabolites in schizophrenia.** *Archiv für Psychiatrie und Nervenkrankheiten* (Berlin). 221(2):167-170, 1975.

The concentrations of chlorpromazine (CPZ) and chlorpromazine sulphoxide (CPZ-SO) in the blood plasma and cerebrospinal fluid (CSF) of 2 CPZ treated schizophrenics (one "good responder" and one "poor responder") were established. The good responder, a 27 year old male, had suffered thought blocking and crowding, auditive perceptual disturbances, neologisms, and delusions of persecution. The patient had responded well to 1200 mg CPZ therapy. The poor responder, a 24 year old female, suffered thought crowding, withdrawal and intrusion attributed to outside agencies, and delusions of influence. Only a slight diminution of anxiety was noted. The patient continued to receive 1200 mg CPZ daily. Cerebrospinal fluid was obtained by lumbar puncture. Plasma and CSF were analyzed by gas chromatography. It was found that while CSF/plasma concentration ratios for CPZ are of the same order of magnitude in the poor and good responder, these ratios for CPZ-SO differ greatly; a very high concentration of CPZ-SO is observed in the CSF of the poor responder. It is concluded that these results may indicate the possible clinical value of CSF levels of psychoactive drugs. 10 references.

251164 Yorkston, N. Royal Northern Hospital, London, England **Beta-adrenergic blockade in the control of schizophrenic symptoms -- a case for controlled studies.** *Scottish Medical Journal* (Glasgow). 20(6):292-294, 1975.

The usefulness of beta adrenergic blockade in treating schizophrenia is briefly discussed. Results of treating acute and chronic patients with propranolol indicate that remission occurred in some patients and that most became obviously calmer. Careful drug administration was necessary to prevent toxic effects. Observations were considered limited because studies were uncontrolled and because of the frequency of toxic reactions in the patients in the early stages. 4 references.

251374 Walinder, Jan; Skott, Annika; Carlsson, Arvid; Roos, Björn-Erik. Department of Pharmacology, University of Göteborg, Sweden **Potentiation by metyrosine of thioridazine effects in chronic schizophrenics: a long-term trial using double-blind crossover technique.** *Archives of General Psychiatry*. 33(4):501-505, 1976.

A study is reported in which four patients with chronic schizophrenia of stationary character were studied in order to titrate the lowest dose of thioridazine necessary for symptomatic control when the drug is given in combination with the inhibitor of catecholamine synthesis, metyrosine. The study showed 15% to 50% of the pretrial dose level of thioridazine hydrochloride was effective. In the present trial, the drug combination was maintained without any alterations in dosage for six months, and the therapeutic effect persisted unchanged. This treatment period was terminated by a double-blind crossover design, and the activity of metyrosine was corroborated in all cases. Plasma drug concentrations and cerebrospinal fluid amine metabolites were measured. The data indicate that schizophrenic symptoms can be profoundly influenced by changes in catecholamine synthesis. Catecholamine carrying neurons thus seem to be fundamentally involved in those brain functions that are disturbed in schizophrenia. It is concluded that the clinical usefulness of metyrosine in combination with neuroleptic agents deserves more extensive investigation. 11 references. (Author abstract modified)

251546 Lehmann, Heinz. Douglas Hospital, Montreal, Quebec, Canada **Options for treatment of the schizophrenic patient.** *Canada's Mental Health* (Ottawa). 24(1):3-9, 1976.

Methods of treating and caring for the schizophrenic patient are discussed. It is noted that if psychiatric patients are not hospitalized or have short hospitalization periods of four to six weeks, they are less likely to be hospitalized later on. It is recommended that hospitalization over a period of years be avoided. It is thought that while even the acutely disturbed psychotic patient can be treated in the community without hospitalization, the financial, social, objective and subjective burdens placed on the patient's family must be considered. The treatment of choice proposed for an acute schizophrenic episode is neuroleptic therapy consisting of pharmacotherapy with major tranquilizers. For the minority who do not respond to such treatment, electroconvulsive therapy and pharmacotherapy should be combined with nonintensive psychotherapy and psychosocial measures. It is thought that negative results observed in studies on megavitamins are cited. It is felt that behavior therapy is sometimes useful for chronic or semichronic problems of readjustment of schizophrenics but that it is of little value for acute schizophrenics. 10 references.

251720 Sathananthan, Gregory; Mir, Pervez; Gershon, Samuel. Neuropsychopharmacology Research Unit, Department of Psychiatry, New York University Medical Center, 550 First Ave., New York, NY 10016 **Antipsychotic effects of AL 1965.** *Current Therapeutic Research*. 19(5):516-519, 1976.

To evaluate the efficacy and safety of a new antipsychotic compound, AL 1965 (an imidazolidinone type of major tranquilizer), 10 psychiatric inpatients hospitalized with acute schizophrenia were observed for their reactions to the compound. The starting dose was 2mg three times daily, and the dose was gradually raised till there was a change in clinical status or side effects occurred. In the doses given, four patients showed complete remission, four showed a partial remission, and two became worse. The extent of the antipsychotic properties of AL 1965 could not be explored fully because of the heavy incidence of extrapyramidal symptoms and the inability to raise the maximum daily dose to its optimum level. (Author abstract modified)

251828 Chouinard, Guy; Annable, Lawrence. Department of Psychiatry, McGill University, Montreal, Quebec, Canada **Clozapine in the treatment of newly admitted schizophrenic patients: a pilot study.** *Journal of Clinical Pharmacology*. 16(5-6):289-297, 1976.

Effects of clozapine in the treatment of six male and four female schizophrenic patients, newly admitted in a brief therapy unit, is examined. Relative efficiency of clozapine was evaluated in a short-term setting with all patients being evaluated by two psychiatrists. Assessment of symptoms is discussed. Results of the study appear to confirm reports that clozapine is an efficacious medication in the treatment of schizophrenia. Confirmation of the low incidence of rigidity among patients treated with clozapine and the absence of dystonic reactions and akathisia is reported. Side-effects that persisted to the end of the study were considered mild. One patient with an increased eosinophil count is cited. 27 references.

251829 Jus, A.; Pineau, R.; Jus, K.; Villeneuve, A.; Gautier, J.; Drolet, A.; Cote, M. Research Division, Department of Psychiatry, Hopital Saint-Michel-Archange, Quebec 5, Canada **A long-term study of penfluridol in chronic schizophrenia.** *Journal of Clinical Pharmacology*. 16(5-6):298-303, 1976.

Long-term penfluridol treatment, lasting one additional year at the end of an initial 32 week clinical trial, was studied in 24 adult chronic schizophrenic patients. Level of improvement, additional improvement, therapeutic failures and type and incidence of side-effects are explored. Conclusions are: that chronic schizophrenic patients with target symptoms of emotional withdrawal, blunted affect, lack of activity and conceptual disorganization, without evident production symptoms, can improve significantly with long-term penfluridol treatment, as better social adaptation is observed, percentage of failure is very low, and no serious side-effects are observed. 7 references.

251996 Lacoursiere, Roy B.; Spohn, Herbert E.; Thompson, Karen. Veterans Administration Hospital, Topeka, KS 66622 **Medical effects of abrupt neuroleptic withdrawal.** *Comprehensive Psychiatry*. 17(2):285-294, 1976.

The medical effects of abrupt neuroleptic withdrawal were investigated in chronic schizophrenic inpatients to determine if the symptoms exceed base rates, if prewithdrawal dosage and type of neuroleptic are significant factors, and if the concurrent administration and/or withdrawal of antiparkinsonian (AP) drugs is necessary to produce the withdrawal symptoms. Literature on the current status of these issues and the experimental data indicated that postwithdrawal symptom rates (38%) significantly exceeded base rates for the total group and for subgroups withdrawal from neuroleptics only and from AP drugs. A relationship between neuroleptic dosage and withdrawal symptoms did not occur nor was a relationship found between neuroleptic type and withdrawal symptoms. Although nonautonomic neuroleptics (piperazines and butyrophenones) alone can lead to withdrawal symptoms, they appear to do so mostly when AP drugs are concomitantly being taken and are withdrawn. The clinical implications of these findings are discussed. 16 references. (Author abstract modified)

252006 Donlon, Patrick T.; Axelrad, A. David; Tupin, Joe P.; Chien, Ching-piao. Department of Psychiatry, School of Medicine, University of California at Davis, 2252 45th St., Sacramento, CA 95817 **Comparison of depot fluphenazines: duration of action and incidence of side effects.** *Comprehensive Psychiatry*. 17(2):369-376, 1976.

Fluphenazine enanthate (FE) and fluphenazine deconate (FD), two long acting injectable (depot) neuroleptics, were compared for effectiveness and safety in reducing acute schizophrenic symptoms and providing maintenance. Clinical duration of action and efficacy of benzotropine mesylate, 2mg b.i.d., as an antiparkinsonian (AP) agent were also investigated. Forty one patients who were experiencing schizophrenic decompensation and whose condition warranted the use of neuroleptic agents were selected for the study. Both compounds proved highly effective antipsychotic agents, and clinical response was rapid allowing for judicious use of hospital beds and significant reduction in symptoms before hospital discharge. Both were equal in efficacy and in producing neurologic side-effects. Extrapyramidal symptoms were similar in incidence, form, and response to AP and resulted from individual sensitivity, molecular structure, dose, age, and sex. AP agents were much less successful in reducing or preventing pseudoparkinsonism and akathisia than acute dystonia. It is concluded that although depot agents provide unique advantages over short acting neuroleptics, they still remain adjuncts in the overall longitudinal management of the psychotic patient, and that they may help implement the development of trust that is essential for comprehensive rehabilitation. 16 references.

252763 Johnson, D. A. W. University Hospital of South Manchester, West Didsbury, Manchester M20 8LR, England **The duration of maintenance therapy in chronic schizophrenia.** *Acta Psychiatrica Scandinavica* (Kobenhavn). 53(4):298-301, 1976.

The incidence of relapse is compared between two groups of chronic schizophrenic patients (mean duration periods 19 months and 29.5 months) discontinuing depot neuroleptic injections, and matched controls remaining on depot injections. Results show a higher relapse rate in patients discontinuing injections, significant at the 1% level, in both groups. The proportion of patients improving upon resumption of depot injections confirms the importance of this form of medication in comparison to prescribed oral medication. Results strongly suggest that there is a significant therapeutic gain in continuing maintenance therapy with depot neuroleptic injections for a minimum period of 3 years after the last relapse in a substantial proportion of chronic schizophrenic patients. 7 references. (Author abstract)

252847 Davis, John M.; Gosenfeld, Lawrence; Tsai, Chun Ching. Illinois State Psychiatric Institute, 1601 West Taylor Street, Chicago, IL 60612 **Maintenance antipsychotic drugs do prevent relapse: a reply to Tobias and MacDonald.** *Psychological Bulletin*. 83(3):431-447, 1976.

The assumption that maintenance doses of antipsychotic drugs prevent relapse in chronic schizophrenic patients is examined in the light of recent criticism. Data from 25 studies are summarized indicating that there is overwhelming evidence that maintenance antipsychotic drugs do in fact prevent relapse in such patients. A total of 377 out of 1884 patients on drugs relapsed (20%) in comparison to 705 out of 1,346 patients on placebo (52%). Tobias and MacDonald's (1974) study questioning the value of such maintenance doses is criticized and refuted. 39 references. (Author abstract modified)

252848 MacDonald, Marian L.; Tobias, Lester L. Department of Psychology, State University of New York at Stony Brook, Stony Brook, NY 11794 **Withdrawal causes relapse? Our response.** *Psychological Bulletin*. 83(3):448-451, 1976.

Reply is made to critics of an earlier study which had questioned the assumption that antipsychotic maintenance drug withdrawal causes relapse in schizophrenics. It is pointed out that this questioning was prompted by two factors: an awareness of serious methodological errors consistently repeated in the withdrawal literature and a philosophy of science dictating that definitive conclusions be drawn only from data collected in a scientifically tenable manner. This philosophy of science is explicated, and three of the more serious methodological errors are discussed. The position is maintained that definitive conclusions concerning withdrawal effects are not warranted on the basis of the existing literature. 21 references. (Author abstract modified)

253018 Erickson, Stephen E.; Hurt, Stephen W.; Davis, John M. Illinois State Psychiatric Institute, Chicago, IL **Dosage of antipsychotic drugs.** *New England Journal of Medicine*. 294(23):1296-1297, 1976.

Double-blind research on the initial required dosage of antipsychotic drugs for acutely decompensated schizophrenic inpatients is briefly reviewed. Ss were treated with either loading or standard doses of haloperidol. Results indicate that for the average decompensated schizophrenic, a moderate dose is sufficient to start the reintegrative process, and that this process cannot be accelerated by digitalization. Since there are

wide individual differences in plasma levels, a flexible dose strategy is recommended. It is suggested that a patient be started on a sufficient but moderate dose and carefully monitored for therapeutic response and side effects. Increases in dosages are indicated if no progress is noted in three or four days. The completely refractory patient is seen as a deserving a trial on high doses of potent phenothiazines or haloperidol. 6 references.

253047 Rifkin, Arthur; Quitkin, Frederic; Rabiner, Charles J.; Klein, Donald F. Department of Psychiatry, Long Island Jewish-Hillside Medical Center, Glen Oaks, NY **Comparison of fluphenazine decanoate, oral fluphenazine, and placebo in remitted outpatient schizophrenics.** *Psychopharmacology Bulletin*. 12(2):24-26, 1976.

The value of fluphenazine decanoate (FD) and oral fluphenazine (FPZ) as maintenance medication in remitted schizophrenics in an aftercare clinic is discussed in a paper presented at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. Seventy three schizophrenic patients in remission were selected at random to receive FD, FPZ, or placebo (PBO). Results show that relapses occurred in 8% on FD, 11% on FPZ and 64% on PBO. More toxicity occurred with FD than FPZ. The relapse rate on PBO is statistically significant and the relapse rate on FD is not significantly different than that on FPZ in any of the comparisons. It is concluded that chronic schizophrenics in remission require prophylactic antipsychotic medication. 4 references.

253048 Abuzzahab, F. S.; Zimmermann, Robert L. Department of Psychiatry, University of Minnesota, Minneapolis, MN 55455 **A three-year double-blind investigation of pimozide versus fluphenazine in chronic schizophrenia.** *Psychopharmacology Bulletin*. 12(2):26-27, 1976.

A three year double blind investigation of pimozide versus fluphenazine in chronic schizophrenia was reported at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. Pimozide was compared with fluphenazine in terms of their relative effectiveness in maintaining chronic schizophrenics on an outpatient treatment basis. Sixty two patients were admitted to the study and received daily doses of either pimozide or fluphenazine. Patient response was evaluated by a clinical investigator using the Brief Psychiatric Rating Scale and the Treatment Emergent Symptoms Scale. No differences between the two drugs were seen until 6 months into the study when ratings on pathology and social adjustment showed differences in favor of pimozide at statistically significant levels. After 6 months the characteristic side-effects of both drugs became established. With drug treatment, serum glutamic oxaloacetic transaminase levels decreased and fasting blood sugar, cholesterol and triglyceride levels rose. 2 references.

253049 Kellams, Jeffrey J.; Small, Joyce G.; Milstein, Victor; Perex, Helio C. Indiana University School of Medicine, Larue D. Carter Memorial Hospital, Indianapolis, IN **Lithium combined with neuroleptics in the treatment of chronic schizophrenia.** *Psychopharmacology Bulletin*. 12(2):27-30, 1976.

The effects of lithium combined with major tranquilizing drugs in the treatment of schizophrenia is examined in a series of experiments reported at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in

Key Biscayne, Florida. Fifteen chronic, hospitalized schizophrenic patients were rated by psychiatrists and nurses using the Brief Psychiatric Rating Scale, Clinical Global Impressions, Nurses Observation Scale for Inpatient Evaluation and the Manic State Rating Scale, and were randomly assigned to one of two sequences, consisting of four alternating treatment periods of four weeks duration beginning with either lithium or placebo. Results indicate that chronic hospitalized schizophrenic patients can be safely treated with lithium combined with major tranquilizers with a low incidence of CNS or other toxicity. Moreover, both blind psychiatric and nursing data and nonblind clinical judgments show that there is significant improvement with lithium. These findings suggest that a trial of lithium combined with psychotropic drugs is warranted in schizophrenic patients who do not respond to conventional treatment. 2 references.

253051 Paprocki, J.; Peixoto, Maria P. Barcala; Andrade, Neuza Mendes. Grupo de Estudos em Psicofarmacologia Clinica, Belo Horizonte, Minas Gerais, Brazil **A controlled double-blind comparison between loxapine and haloperidol in acute newly hospitalized schizophrenic patients.** *Psychopharmacology Bulletin*. 12(2):32-34, 1976.

A two year controlled double-blind comparison between loxapine and haloperidol in acute newly hospitalized patients was reported at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. In phase one of the study, 30 acute schizophrenic female inpatients were treated with either loxapine or haloperidol administered randomly for a 90 day period. Psychological ratings were periodically checked. Results indicate improvement in both treatment groups with no significant difference observed between loxapine and haloperidol as to their efficacy, tolerability and side effects. In phase two, a 1 year followup of each patient revealed no significant difference between the groups in remission times or incidence of relapse. In phase three, patients who relapsed after the first trial were treated with an alternate medication. Results indicated no difference in improvement between groups. It is concluded that loxapine is as effective as haloperidol in the treatment of schizophrenia. 12 references.

253052 Fischer-Cornelissen, Kurt A.; Ferner, Uwe J. Biological and Medical Research Division, Sandoz, Ltd., Basle, Switzerland **An example of European multicenter trials: multispectral analysis of clozapine.** *Psychopharmacology Bulletin*. 12(2):34-39, 1976.

Multicenter double-blind trials evaluating the efficacy and tolerance of clozapine in comparison with standard neuroleptics for treatment of paranoid schizophrenia were reported at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. Seven hundred twenty three patients were treated with chlorpromazine, and haloperidol, trifluoperazine, clopenthixol and clozapine for 42 days. Diagnosis of severity of illness preceded the trials and psychological ratings and physiological measurements were monitored periodically. Results show that clozapine is at least as efficacious as chlorpromazine, haloperidol and clopenthixol and only trifluoperazine is more efficacious. 4 references.

09 DRUG TRIALS IN AFFECTIVE DISORDERS

243023 Post, Robert M.; Cramer, Hinrich; Goodwin, Frederick K. Section of Psychobiology, Adult Psychiatry Branch, NIMH, Bethesda, MD 20014 Cyclic AMP in cerebrospinal fluid in patients with affective illness: effects of probenecid, activity, and psychotropic medications. (Unpublished paper) Bethesda, MD, NIMH, 1976. 12 p.

Levels of cyclic 3',5'-adenosine monophosphate (cAMP) in cerebrospinal fluid (CSF) were examined in patients with affective disorders following probenecid, activity, or psychotropic medications. Results indicate that cAMP levels in the CSF of these Ss ranged from 3-26 picomoles/ml and increased approximately 300% following 18 hours of probenecid administration. Baseline levels of cAMP were higher in depressed patients than neurological controls, although depressed patients did not differ from manics in either baseline levels, levels of cAMP, or probenecid induced accumulations. Four hours of hyperactivity prior to lumbar puncture did not alter cAMP level. Baseline or probenecid induced accumulations of cAMP did not correlate with severity of depression, age, sex, or with simultaneously obtained levels of neurotransmitter metabolites; cAMP did not differ according to diagnostic subgroups of unipolar or bipolar depression, agitated or retarded depression. Treatment with a variety of psychotropic medications or with electroconvulsive therapy had no significant effect on probenecid induced accumulations of cAMP, with the exception of L-tryptophan, which led to lower levels of accumulation. 38 references.

243860 Marjerrison, G. Department of Psychiatry, University of Saskatchewan, Saskatoon, Saskatchewan, Canada Psychotherapy and tricyclic antidepressants. *Diseases of the Nervous System*. 37(3):15-16, 1976.

The use of a structured interview technique for measuring the effectiveness of the tricyclic antidepressants in depressed patients is discussed. The technique was used to determine the effect of four tricyclic antidepressants and a placebo on 60 new admissions to a regional psychiatric hospital in Saskatchewan. The structured interview technique was conducted with each S before treatment and at the end of a 4 wk period, the tape recorded interviews were content analyzed. Rates of usage of self-referred affect statements and changes of its rates under the various periods of the interview in response to the systematic variation in the interviewer's verbal behavior: were scored. Interviewers used affirming reinforcement of self-referred affect statements or silence, so that there were measurements within the "operant" Period 2, "reinforcing" Period 3, and "extinction" Period 4. It is concluded that before tricyclic treatment, the patients were not responding to selective reinforcement in Period 3 by increasing rates of making self-referred affect statements. They did show this specifically conditioned response in Period 3 after treatment, followed by a decline in Period 4. Those patients receiving placebo did not show this change. 3 references.

243861 Hollister, Leo E. Stanford University, School of Medicine, Palo Alto, CA 94304 Clinical use of tricyclic antidepressants. *Diseases of the Nervous System*. 37(3 Section 2):17-21, 1976.

The clinical application of the tricyclic antidepressants is discussed. It is proposed that the tricyclics are most useful in aiding patients suffering from endogenous depression. Diagnosis of depression is of major importance in determining the nature of treatment to be used. It is noted that the tricyclics are quite similar; with the exception of doxepin, they are equally

effective in blocking the amine pump mechanisms, the pharmacologic action most pertinent to their antidepressant action. A wide range of dose must be explored, with proper dose defined by alleviation of depression or intolerable side-effects. Maintenance doses should be reduced to the lowest consistent with continued relief. Treatment should be brief if the episode of depression is the first and is not severe, but may be prolonged for years in patients with frequent and severe recurrences. Other drugs may sometimes be required, and psychosocial approaches to treatment are always required. The hazards of tricyclics are well known and generally are extensions of known pharmacologic effects. (Author abstract modified)

243863 Frazier, Shervett H. McLean Hospital, Belmont, MA Changing patterns in the management of depression. *Diseases of the Nervous System*. 37(3, Section 2):25-29, 1976.

Changing patterns in the treatment of depression are reviewed. While pharmacotherapy has significantly altered the treatment potential of depressive illness over the past 15 years, psychotherapists still cling to the psychodynamic theories of treatment that predate these chemical advances, and are hesitant and unsure about the proper use of pharmacotherapy. The biogenic amine theories of depressive illness are reviewed, and the effect of psychotropic drugs, particularly the tricyclic antidepressants, on the level of biogenic amines is considered. Techniques for assuring the effectiveness of medication through proper diagnosis and the use of rating scales are surveyed. Establishment of the proper drug regimen requires the determination of a drug-free baseline from which to gauge the effectiveness of treatment. 16 references.

243864 Shader, Richard I. Massachusetts Mental Health Center, 74 Fenwood Road, Boston, MA 02115 Problems of polypharmacy in depression. *Diseases of the Nervous System*. 37(3, Section 2):30-34, 1976.

Indications justifying the use of multiple drugs in treating depression are considered, and some of the more common combined drug regimens are surveyed. The combined regimens discussed are: 1) antidepressants and sedative/hypnotics; 2) antidepressants and neuroleptics; 3) tricyclic antidepressants and thyroid drugs; 4) antidepressants and methylphenidate; 5) antidepressants and lithium carbonate; and 6) antidepressants and other agents. Reasons for the enhanced pharmacologic effect of particular drug combinations are discussed. 44 references.

243979 Rybakowski, Janusz; Trzebiatowska-Trzeciak, Olga. Klinika Psychiatryczna AM, ul. Szpitalna 27/33, 60-572 Poznan, Poland Prophylactic and therapeutic effects of lithium and hereditary factors in patients with manic-depressive psychosis. *Profilaktyczny i leczniczy efekt litu a obciążenie dziedziczne u chorych z psychozą maniako-depresyjną*. *Psychiatria Polska* (Warszawa). 9(5):503-508, 1975.

The dependence of the effect of lithium on the hereditary character of affective psychoses was studied in 35 manic-depressive patients, 29 of whom received lithium therapeutically, during the manic (16 patients) or depressive (13 patients) phase, and 28 of whom received lithium prophylactically, during remission. The remission period generally lasted at least 2 years. Twenty two patients received lithium both therapeutically and prophylactically. The average coefficient of effectiveness, computed according to criteria specified in advance, was 0.6 during a phase and 0.7 during remission. It was similar in patients in whom no indications of the hereditary nature of

the disease existed. In the group with a positive indication of the hereditary involvement, better agreement was found between therapeutic and prophylactic effects of lithium. 13 references. (Journal abstract modified)

243985 Rybakowski, Janusz; Chlopocka-Wozniak, Maria. Klinika Psychiatryczna AM, ul. Szpitalna 27/33, 60-572 Poznan, Poland /Prophylactic effectiveness of lithium in patients with affective disturbances./ Skuteczność profilaktyczna litu u chorych z zaburzeniami afektywnymi. *Psychiatria Polska* (Warszawa). 9(4):417-422, 1975.

The prophylactic effectiveness of long-term lithium carbonate therapy was studied in 30 cases of affective disorders in which at least two phases of the disease had taken place during the 2 year period preceding therapy. The length of lithium therapy ranged from 16-41 months. Sixteen of the patients showed no symptoms of the disease during this period. In six cases the symptoms of manic or depressive stages appeared but were mild enough to make hospitalization unnecessary; in these cases, the number of phases was lowered significantly. In eight cases hospitalization was required during lithium therapy; the duration of the phase was reduced slightly in these patients. The different prophylactic effects of lithium were not dependent upon the average lithium concentration in serum and erythrocytes in the different groups. In the group in which lithium had little or no effect, most patients had had three or more phases during the preceding 2 years. 11 references. (Journal abstract)

244495 Fieve, Ronald R.; Milstoc, Mayer; Kumbaraci, Turkan; Dunner, David L. New York State Psychiatric Institute, 722 W. 168th Street, New York, NY 10032 The effect of lithium on red blood cell cholinesterase activity in patients with affective disorders. *Diseases of the Nervous System*. 37(5):240-243, 1976.

The effects of lithium carbonate upon red blood cell (RBC) cholinesterase (acetylcholinesterase) activity among manic-depressive and unipolar depressive patients were studied. A sample of 182 patients was used, including 49 placebo treated patients, 88 patients treated with lithium carbonate alone, and 45 patients receiving antidepressants concurrently with lithium. Patients were classified as unipolar or bipolar by at least one senior researcher. Samples of blood were collected over a period of 1.5 years, and RBC cholinesterase activity was assessed. The RBC cholinesterase activity of untreated affective disorder patients was significantly lower than that of normals. Lithium carbonate exerts its greatest effect on bipolar female patients by raising red blood cell cholinesterase values. Overall, placebo groups had significantly lower RBC cholinesterase activity than either treatment group. The hypothesis that cholinergic substances involved in the transmission or modulation of brain activity play an important role in the control of mood and behavior is supported. 13 references.

244498 Tsuang, Ming T. 500 Newton Road, Iowa City, IA 52242 Lithium therapy: practical aspects. *Diseases of the Nervous System*. 37(5):282-285, 1976.

Some of the principles and precautions for the safe and most advantageous possible administration of lithium are reviewed. Therapeutic lithium treatment is indicated in manic episodes; it also has a prophylactic effect in the prevention of manic episodes and bipolar depression. Other instances where lithium has slight or no value are considered. An acutely ill depressed patient receives tricyclic antidepressants or electroconvulsive therapy (ECT) to control the current episode,

with lithium maintenance instituted to prevent recurrence. Blood levels of lithium must be carefully monitored to prevent toxicity and to ensure the maximum therapeutic effect. Generally, the safe, therapeutic dose range is between 0.5 and 1.0 mEq/l. When a regimen of lithium maintenance is to be initiated, the recommended initial dose is 300mg lithium carbonate twice daily for the first week, consequently readjusting the dosage to lie within the safe blood level range. Various symptoms of lithium toxicity are reviewed, noting that these are usually experienced when serum levels rise above 1.5 mEq/l. Supportive therapy for moderate to severe lithium poisoning is discussed. 25 references.

244574 Goodwin, Frederick K.; Ebert, Michael H. Lab. of Clinical Science, NIMH, 9000 Rockville Pike, Bldg. 10, Rm. 4S239, Bethesda, MD 20014 The drug treatment of mood disorders. Part II: antimanic and antidepressant agents, maintenance treatment, and recent advances. (Unpublished paper). Bethesda, MD, NIMH, 1976. 33 p.

Recent advances in the psychopharmacology of depression and mania are reviewed, focusing on the major classes of drugs used in treatment and management, considerations in selecting the proper compound, and side-effects. Drug treatment of hypomania and mania involves early administration of lithium, followed by major tranquilizers (phenothiazines and haloperidol) if necessary. Tricyclic antidepressants are usually administered in treating depression, while monoamine oxidase inhibitors, lithium, and phenothiazines are used less often. Prophylactic approaches to long-term management of recurrent affective illness are of significant importance and utilize the same drugs (mainly lithium and tricyclics) in different regimens according to the type of disorder, its severity, and chronicity. Recent pharmacological advances in treating and maintaining patients with affective disorders include monitoring drug blood levels, use of biological predictors of differential drug response (particularly amine metabolites) that occur in urine and cerebrospinal fluid, and endocrine potentiation analyses of response to tricyclic antidepressants. 40 references.

244588 Addabbo, A.; Dell'Unto, A. Ospedale Psichiatrico 'S. Niccolo', Siena, Italy /Trazodone: therapeutic effectiveness in endogenous depression, compared with blood levels./ Trazodone: efficacia terapeutica nella depressione endogena, confrontata con i livelli ematici. *Rassegna di Studi Psichiatrici* (Siena). 64(6):943-954, 1975.

Blood concentrations of trazodone were investigated in 10 patients suffering from endogenous depression. A maximum dose of 7mg/kg/day per os was administered to seven Ss, beginning with 3.5mg/kg/day and doubling this dose on the fourth day. Dosage was constant for three of the patients for the entire period (3.5mg/kg/day). A particular type of concentration curve was found with high doses, and a steady state was found with low doses of the drug. There was no satisfactory correlation between blood concentration and variation in symptoms. The particular form of the curve in the cases treated with high doses has also been shown in animals. 20 references.

244589 Roccatagliata, G.; Abbruzzese, G.; Albano, C.; Gandolfo, C. Clinica delle Malattie Nervose e Mentali, Università di Genova, Genoa, Italy /Intravenous trazodone with depressive syndromes./ Il trazodone per via venosa nelle sindromi depressive. *Rassegna di Studi Psichiatrici* (Siena). 64(6):932-942, 1975.

The effects of intravenously administered trazodone, 2,3,4-(m-chlorophenyl)-1-piperazinylpropyl-5-triazol-4,3a-pyridine-3(2

lone, were investigated with a population of depressed patients. The drug was administered for 10 days according to the following dosage schedule: 200mg/day for 2 days; 300mg/day in two daily administrations for 2 days; 400mg/day for 6 days. Trazodone seems more effective with endogenous and involuntional depression than with neurotic depression. Trazodone basically acts on the nuclear symptoms of depression; it takes effect rapidly and does not cause serious side-effects. Twenty four hour urinary excretion of 5-hydroxyindoleacetic acid (5-HIAA) was measured before and after treatment; the findings fail to correlate with the therapeutic results. There was only one correlation between the amount of 5-HIAA in the urine and the age of the patient: the more advanced the patient's age, the greater the excretion of the serotonin metabolite. 15 references. (Journal abstract modified)

244664 Henry, George M.; Buchsbaum, Monte; Murphy, Dennis L. 1055 Walnut Street, Macon, GA 31201 **Intravenous L-DOPA plus carbidopa in depressed patients: average evoked response, learning, and behavioral changes.** *Psychosomatic Medicine*. 38(2):95-105, 1976.

The safe intravenous administration of L-DOPA in amounts sufficient to alter cortical average evoked response (AER) and learning function in 13 depressed patients with the concurrent oral administration of the peripheral decarboxylase inhibitor carbidopa (L-alpha-methyl-dopa-hydrazine) is reported. Unipolar and bipolar depressed patients responded differently to the alterations in brain biogenic amines and also to the non-specific stress of the experiment. Intravenous L-DOPA given acutely had effects on the AER that were similar to those documented with oral dopa given chronically, an augmentation of amplitude/intensity slopes in unipolar patients and a relative reduction of slopes in bipolar patients. In contrast, intravenous L-DOPA did not enhance verbal learning as did chronic oral treatment, but rather was associated with reduced learning compared with placebo infusions. Different neurochemical changes following L-DOPA given in single intravenous doses potentially account for differences in learning and behavioral changes from chronic oral administration. 66 references. (Author abstract modified)

245016 Lion, John R.; Millan, Carlos; Taylor, Ronald J. Institute of Psychiatry and Human Behavior, University of Maryland School of Medicine, Baltimore, MD 21201 **Reserpine and the induction of depression: a case report.** *Diseases of the Nervous System*. 36(6):321-322, 1975.

A case report is presented of an explosive and antisocial personality type who was treated with reserpine in order to induce mild depression to make the patient more amenable to conventional psychotherapy. Successful use of the drug is reported, but instances are cited where psychotic depression has occurred, with serious and dangerous results such as suicide or mania. Typical effects of reserpine include heightened degree of introspection, fantasy, dreaming, and depression in the sense of tranquilization. 14 references.

245416 Fieve, Ronald R. New York State Psychiatric Institute, 722 West 168th St., New York, NY 10032 **Lithium prophylaxis in affective disorders.** *New York State Journal of Medicine*. 75(8):1219-1221, 1975.

Lithium therapy is favorably compared to the more traditional combination of electroshock, psychotherapy, and multiple drug therapy in the treatment of severe manic and depressive states. Reasons proposed for the relatively slow research and development of lithium therapy as compared to other therapeutic forms include: 1) a psychodynamic orientation on

the part of the professionals; and 2) the misdiagnosis of many manic cases as schizophrenic or as personality disorders. The advantages of lithium therapy are considered to be its clinical effectiveness and the possibility of maintaining normal functioning without interfering with personality or creativity. 13 references.

245468 Murphy, J. E.; Donald, J. F.; Beaumont, G. no address **A controlled comparative trial of a combination of opipramol and clomipramine and a higher dose of clomipramine alone.** *Journal of International Medical Research* (Northampton). 3(1):26-31, 1975.

A comparison of the effects of 50 mg opipramol and 10 mg clomipramine given three times daily is made with the effects of 25 mg clomipramine given three times daily to 60 patients suffering from anxiety depressive states in order to determine which combination is more effective. A double dummy technique was used to ensure blindness. A stratified randomization technique was employed but was found not to work effectively as far as severity was concerned, producing some imbalance in the groups. After 2 weeks the opipramol/clomipramine regime was significantly more effective in the relief of anxiety, whereas the clomipramine 25 mg regime brought about a significantly greater improvement in the symptom of depressed mood. 3 references. (Author abstract modified)

245510 Van Praag, Herman M.; Korff, Jacob. Department of Biological Psychiatry, Psychiatric University Clinic, Oostersingel 59, Groningen, The Netherlands **Neuroleptics, catecholamines, and psychoses: a study of their interrelations.** *American Journal of Psychiatry*. 132(6):593-597, 1975.

Central catecholamine metabolism in various symptomatological psychotic disorders and the relationship between the biochemical and therapeutic action profiles of neuroleptics are examined in 33 patients with acute psychotic disorders of delusions and/or hallucinations. Results show that haloperidol and chlorpromazine increased the dopamine (DA) turnover in the central nervous system without demonstrable influence on the noradrenaline metabolism; oxyperine had the reverse effect. The question is posed whether disorders of DA metabolism underlie or result from disorders of motor activity; it is postulated that hyperdopaminergic activity observable in psychosis might be dependent on motor hyperactivity rather than on true psychotic symptoms such as delusions and hallucinations. 29 references. (Journal abstract modified)

245521 Shaw, Jon A.; Donley, Patrick; Morgan, Donald W.; Robinson, James A. Department of Psychiatry and Neurology, Walter Reed Army Medical Center, Washington, DC 20012 **Treatment of depression in alcoholics.** *American Journal of Psychiatry*. 132(6):641-644, 1975.

Treatment of depression in alcoholics is evaluated using either placebo or chlorodiazepoxide-imipramine in a double-blind study. Although depression decreased in both groups, there were no significant differences between them on any of three pretreatment and posttreatment measures. The Zung scale showed that medication decreased depression significantly; however, this finding was not supported by the Beck Depression Inventory or the Minnesota Multiphasic Personality Inventory. The use of multiple instruments in the measurement of depression is recommended due to this apparent measurement of different dimensions of depression by different instruments. The observed failure of the combination of drugs to significantly outperform placebo indicates that these drugs should be introduced only when specifically warranted. 17 references. (Journal abstract modified)

245646 Berger, Frank M. Department of Psychiatry and Behavioral Sciences, University of Louisville School of Medicine, Louisville, KY **Depression and antidepressant drugs.** *Clinical Pharmacology and Therapeutics.* 18(3):241-248, 1975.

The present status of studies relating to the etiology, pathogenesis and treatment of depression is summarized. It appears that endogenous depression has a physical basis that is probably closely related to a disturbance of the 5-hydroxytryptamine (5-HT) and ACH metabolism. It is felt that although the disease is relatively homogeneous, it is probably not one disease, but a group comprising several disorders that differ from each other in their biochemistry. The course of severe endogenous affective disorders is not considered easily influenced by psychotherapy or by the attitude of the doctor or patient. The new antidepressants prove to be of considerable value in about two thirds of patients although the onset of action of the tricyclics is slow and improvement may take 3 weeks to become apparent. Reactive depression is considered to be controllable over a period of time by counseling, reeducation, psychotherapy, and administration of anxiolytics. It is concluded that a great need exists for new antidepressants differing from existing drugs in being more rapidly and reliably effective and free from peripheral anticholinergic side-effects. 56 references.

245784 Glassman, Alexander H.; Kantor, Shepard J.; Shostak, Michael. Dept. of Psychiatry, College of Physicians and Surgeons, Columbia University, New York, NY **Depression, delusion and drug response.** *American Journal of Psychiatry.* 132(7):716-719, 1975.

Depressed patients with delusions are found to be markedly unresponsive to tricyclic drug therapy in an ongoing study of depressed patients. After four weeks of administration of imipramine hydrochloride, only 3 of 13 delusional depressed patients responded to the drug, but 14 of 21 nondelusional depressed patients responded. It is concluded that delusional depressed patients should not be treated with tricyclic antidepressants and that current research with depressed patients should be reevaluated in light of this finding. 21 references. (Journal abstract)

246425 Jancar, V. G.; Arony, A. J.; Hrachovec, J. P. 1516 Union Street, Schenectady, NY 12309 **Recent clinical experience with treatment of depression with Gerovital H3 tablets.** *Gerontologist.* 15(5):34, 1975.

In a paper given at the 28th annual meeting of the Gerontological Society, Louisville, Kentucky, October 1975, a study of treatment of depression with Gerovital H3 (GH3) tablets is presented together with a brief review of similar studies. Previous studies have indicated that GH3, containing as active ingredient procaine hydrochloride, is beneficial in various complaints of old age, including depression. Macfarland and Hrachovec suggest that GH3 is a reversible monoamine oxidase inhibitor. Other findings, such as that the activity of neuronal monoamine oxidase increases with age, make clinical studies with GH3 a necessity. Clinical studies on 16 patients in private practice who have finished the first course of GH3 tablets are reported. Patients selected were over 45 years of age and suffered from symptoms of depression from various causes. They received an increasing dosage over 6 weeks, starting with three tablets a day of 100mg of procaine per tablet, up to optimum response, but not more than six tablets daily. Zung SDS, Zung DSI, and CGI psychological tests were used on a biweekly basis, together with measurement of standard physical signs. Blood chemistry, urinalysis, and EKG were taken before and after the study. The following symp-

toms were very much improved: decisiveness, sexual libido, mental and physical energy, and sleeping patterns. (Author abstract modified)

246623 Jensen, K.; Fruensgaard, K.; Ahlfors, U.-G.; Pihkanen, T. A.; Tuomikoski, S.; Ose, E.; Dencker, S. J.; Lindberg, D.; Nagy, A. Dept. of Psychiatry, Odense Hospital, Univ. of Odense, Odense, Denmark **Tryptophan/imipramine in depression.** *Lancet (London).* 2(7941):920, 1975.

In a letter to the editor, the antidepressive properties of tryptophan alone are compared to imipramine based on a double-blind experiment in which 42 inpatients with endogenous depression were treated with one or the other drug. Both groups showed statistically significant improvements over pretrial scores on the Hamilton rating scale. The reduction of symptoms was more rapid for the imipramine group but side effects were less frequent in the tryptophan group. The results of earlier experiments with tryptophan are discussed in light of the present study's findings. 10 references.

246629 Baron, Miron; Gershon, Elliot S.; Rudy, Victor; Jonas, Wulff Z.; Buchsbaum, Monte. Albert Einstein College of Medicine, Yeshiva University, New York, NY 10033 **Lithium carbonate response in depression: prediction by unipolar/bipolar illness, average-evoked response, catechol-O-methyl transferase, and family history.** *Archives of General Psychiatry.* 32(9):1107-1111, 1975.

The antidepressant efficacy of lithium carbonate is assessed. In a double-blind trial in 23 hospitalized depressed patients, unequivocal response was significantly more frequent in bipolar than in unipolar depressed patients. It was also found that lithium carbonate responders had a greater visual average evoked response amplitude increase in response to increased stimulus intensity, termed augmenting. It is concluded that no correlation can be demonstrated between lithium carbonate efficacy and either erythrocyte catechol-O-methyl transferase activity, age of symptom onset, number of hospitalizations, or family history of affective disorders. 46 references. (Author abstract modified)

247216 Shopsin, B.; Gershon, S.; Goldstein, M.; Friedman, E.; Wilk, S. Neuropsychopharmacology Research Unit, Dept. of Psychiatry, New York Univ. Medical Center, 550 First Ave., New York, NY 10016 **Use of synthesis inhibitors in defining a role for biogenic amines during imipramine treatment in depressed patients.** *Psychopharmacology Communications.* 1(2):239-249, 1975.

A study was made which attempted to define more clearly, by the use of specific synthesis inhibitors of both catecholamines and indolamines, the particular biogenic amine involved in the clinical antidepressant effect of the tricyclic drug imipramine. Longitudinal data on five psychiatric inpatients, three diagnosed as unipolar depressive and two as bipolar, collected during combined treatment with either imipramine/alpha-methylparatyrosine (alpha-MPT) or imipramine/p-chlorophenylalanine (PCPA), are presented. It was found that patients who showed an antidepressant response to imipramine continued to show sustained well being after alpha-MPT treatment, whereas depression returned when small doses of PCPA were administered for brief periods. It is suggested that the clinical antidepressant effect of imipramine in man probably involves serotonergic rather than adrenergic mechanisms. 18 references. (Author abstract modified)

247482 Sugerman, A. Arthur; Swartzburg, Marshall; Mueller, Peter S.; Rochford, Joseph. Carrier Clinic Foundation, Belle

Mead, NJ Oral protirelin (T.R.H.) in depression. *Current Therapeutic Research*. 19(1):94-98, 1976.

The effectiveness of protirelin as an antidepressant when given orally in high doses was investigated. Synthetic thyrotropin-releasing hormone (T.R.H.) was given to 16 patients, recently admitted to a psychiatric hospital for treatment of severe depression. A double-blind design was used in which some patients received 300mg orally on each of three days in the first week of the study, while the others had this dose in the second week. Placebo was given on all other days. The compound showed no evidence of antidepressant activity or significant adverse effects. 9 references. (Author abstract modified)

247543 Ginestet, D. Hopital de Versailles, 1, rue Richaud, 78-Versailles, France /Efficacy and tolerance limits in the use of antidepressant drugs./ Limites d'efficacite et de tolerance des medicaments anti-depresseurs. *Encephale* (Paris). 1(3):203-210, 1975.

At the 9th Session on Psychiatric Information, held in Marseilles, March 1975, drawbacks in the use of several antidepressant drugs were discussed. It was noted that 35% to 40% of all depressions resist antidepressants, requiring recourse to electroshock in some cases. Recurrent monopolar depressions, hypochondriac depressions in aged patients, and depressive states in psychotic evolutions were identified as the most difficult to treat. Resistance factors which appear in reactive and neurotic depressions were observed to be independent of the pharmacological action. Unsolved tolerance problems in tricyclics, such as confusional states and cardiac toxicity, and the numerous dangerous combinations associated with monoamine oxidase inhibitors were noted. New compounds with antidepressive action, such as those affecting the hypothalamus, were offered as research hypotheses rather than means of treatment. The problems of maximal doses and long-acting antidepressants were also discussed. 8 references. (Author abstract modified)

247554 Deniker, P.; Loo, H.; Verdeaux, G.; Oughourlian, J. - M. Hopital Sainte-Anne, 1, rue Cabanis, 75014 Paris, France /A clinical and electroencephalographic study of a new antidepressant agent, metylamino-propyldibenzobicyclooctadiene chlorhydrate (Ciba 34.276 Ba)./ Etude clinique et electro-encephalographique d'un nouvel agent antidepresseur, le chlorhydrate de mono-methyl-amino-propyl-dibenzo-bicyclo-octadiene (Ciba 34.276 Ba). *Encephale* (Paris). 1(3):265-278, 1975.

Fifty patients with different types of depression were treated with a new compound (dibenzobicyclooctadiene) derivative with a quadricyclic structure, Ciba-34276-Ba or Maprotiten. The product was found to have notable antidepressive properties, capable of acting on the melancholic depressions of manic depressive psychosis and of involutional melancholia. The best results were noted in neurotic and reactive depressions, perhaps because of the marked tranquilizing activity in the majority of the cases. The clinical tolerance was found to be good and the side effects, which resemble those caused by derivatives of imipramine, remained moderate. The biological tolerance was perfect. The modifications of the electroencephalogram were of two types: one of them suggesting thymoanaleptic activity, the other suggesting a sedative activity. 13 references. (Author abstract modified)

247582 Dunner, David L.; Stallone, Frank; Fieve, Ronald R. Dept. of Internal Medicine, New York State Psychiatric Institute, 722 W. 168th St., New York, NY 10032 Lithium carbonate and affective disorders. V: a double-blind study of

prophylaxis of depression in bipolar illness. *Archives of General Psychiatry*. 33(1):117-120, 1976.

The efficacy of lithium carbonate as a prophylactic drug against depression in bipolar manic-depressive patients was assessed through a double-blind, placebo controlled study of patients who had histories of recurrent depression and hypomanias (bipolar 2). The results revealed that treatment with lithium carbonate resulted in a reduction in the frequency of hypomanic episodes. However, no reduction in the frequency of depression attacks was observed with lithium carbonate treatment during the study (mean length of study, approximately 16 months), although there was a suggestion that the depressive attacks that occurred during treatment with lithium carbonate might be less severe than with placebo treatment. 18 references. (Author abstract)

247711 Naylor, G. J.; Watson, Y.; Stewart, M.; Worrall, E. P.; Dick, P.; Peet, M. Royal Dundee Liff Hospital, Dundee DD2 5NF, England Trial of digoxin in mania. *Lancet* (London). 2(7936):639-640, 1975.

The hypothesis that mania is associated with an increased membrane transport of sodium was investigated in a double-blind trial of a specific Na-K-APTASE inhibitor (digoxin) in 12 female inpatients with mania. Patients were rated on a seven point global mania rating scale and on scales which rated activity, talk, and mood. It was found that although individual patients differed the trial failed to show any effect of digoxin on mania. It is concluded that there is no evidence to support the suggestion of Glen and Reading that increased membrane transport of sodium is etiologically related to mania. 5 references.

247969 Salvadorini, Francesco; Galeone, Francesco; Nicotera, Mario; Ombrato, Marcello; Saba, Paolo. Department of Medicine, Psychiatric Hospital of Volterra, Pisa, Italy Clinical evaluation of CDP-choline (Nicholin): efficacy as antidepressant treatment. *Current Therapeutic Research*. 18(3):513-520, 1975.

The therapeutic effect of cytidine diphosphato choline (CDP-choline) was investigated in eight patients affected by depressive disease. In these subjects basally the effect of acute intravenous CDP-choline administration on plasma growth hormone (GH) levels was also evaluated. The finding of a reduced GH response confirms that an impairment in dopamine metabolism can be a decisive feature in the genesis of depressive disease. Moreover, the good improvement in the mental state obtained in all the patients suggests the possibility of a new causal therapy. 17 references. (Journal abstract)

248583 Sternberg, David E.; Jarvik, Murray E. National Naval Medical Center, Bethesda, MD Memory functions in depression: improvement with antidepressant medication. *Archives of General Psychiatry*. 33(2):219-224, 1976.

In an attempt to elucidate the memory deficit in depression, short-term memory and long-term memory were examined by means of a memory test battery in 26 hospitalized patients assigned a diagnosis of one of the major affective disorders. Their performance was compared with a matched control group and with the performance of those 20 patients who improved after 26 days of treatment with antidepressants. Results indicate that depressed patients show marked impairment in short-term memory without an impairment in long-term memory. The greater the improvement of the clinical state, the greater the improvement in short-term memory, whereas long-term memory was not influenced by the therapeutic success. 40 references. (Author abstract)

248977 Wheatley, David. General Practitioner Research Group, 325 Staines Road, Twickenham, TW2 5Ax, England **Controlled clinical trial of a new antidepressant (Org. GB 94) of novel chemical formulation.** *Current Therapeutic Research.* 18(6):849-855, 1975.

Org. GB 94 (mianserin), a new antidepressant of original formulation, was compared to amitriptyline in a double-blind comparative trial conducted over 4 weeks in 79 depressed patients. Patients were allocated to treatment by random selection. Antidepressant effects were assessed on the Hamilton Depression scale and defined global assessments. On both measures very similar results were recorded for the two drugs with no statistically significant differences at any period of the trial. The incidence of side-effects was similar, the commonest with Org. GB 94 being drowsiness, and the commonest with amitriptyline being dry mouth. It is concluded that there may be advantages in using a nontricyclic drug in the treatment of depression. 9 references. (Author abstract modified)

249535 Lee, C. R.; Hill, S. E.; Dimitrakoudi M.; Jenner, F. A.; Pollitt, R. J. University Department of Psychiatry, Middlewood Hospital, P. O. Box 134, Sheffield, S6 1TP, England **The relationship of plasma to erythrocyte lithium levels in patients taking lithium carbonate.** *British Journal of Psychiatry* (London). 127:596-598, 1975.

The relationship of plasma to erythrocyte lithium levels in patients being treated with lithium carbonate is investigated as a meaningful variable for use in research. Plasma and erythrocyte lithium levels were determined repeatedly in 12 patients taking lithium carbonate for affective disorders. In any individual the plot of the plasma lithium level against erythrocyte/plasma ratio is found to be linear, but it is observed that the ratio can either increase or decrease with increasing plasma lithium concentration. Erythrocyte/plasma ratio is found to be an unsound basis for comparing individual responses to lithium. 8 references. (Author abstract modified)

249798 Pfeiffer, Kenneth; Maltzman, Irving. University of California, Los Angeles, CA 90024 **Warned reaction times of manic-depressive patients with and without lithium.** *Journal of Abnormal Psychology.* 85(2):194-200, 1976.

An attempt is made to assess the performance of manic-depressive patients and matched normal control subjects by the use of reaction time. A warned reaction time task was employed with normal control subjects and manic-depressive patients in the free, hypomanic, and depressed states, with and without maintenance levels of lithium carbonate. A warning light appeared at a variable interval preceding a light to which the subject responded with a key press. All subjects received both a regular and an irregular series with warning intervals of 1, 2, 4, 8, and 16 sec. In the regular series, blocks of intervals were presented in an ascending order. In the irregular series, each interval followed every other interval equally often. Manic-depressive patients were uniformly slower than control subjects in both series at all intervals. Maintenance levels of lithium facilitated reaction times, particularly at the longer intervals in the irregular series. Depressive as well as hypomanic states tended to yield faster reaction times than the free state. 5 references. (Author abstract modified)

251118 Woggon, B.; Angst, J.; Bleuler, M.; Dittmer, Th. L. J.; Heinrich, K.; Hippus, H.; Martens, H.; Seibel, I. Psychiatrische Universitätsklinik, Lengstrasse 31, Postfach 68, CH-8029, Zurich, Switzerland **Comparison of a new antidepressant, lofepramine with imipramine in a double-blind multicentre trial.** *Archiv für Psychiatric und Nervenkrankheiten* (Berlin). 221(2):157-165, 1975.

The therapeutic effects and side-effects of lofepramine (an imipramine derivative) are compared to those of imipramine in a clinical trial with 101 patients suffering from endogenous depression. Forty nine patients (mean age 49.4 years) were treated with imipramine (150mg/day). A double-blind multicenter trial, evaluated by means of the AMP system, showed a high degree of concurrence with regard to the therapeutic effects of the two drugs. Side-effects were also very similar; a slightly greater increase in hand tremor with lofepramine was noted, but thirst and dryness of the mouth were found to be transitory. With both drugs decreases in constipation, pressure within the head, cardiac sensations, vertigo, and perspiration were noted. 7 references.

251128 Jacobs, Leonard S.; Green, Richard A.; Gillin, J. Christian; Wyatt, Richard J. Kalihi-Palama Community Mental Health Center, Mental Health Division, Department of Health, 810 No. Vineyard Boulevard Honolulu, HI 96817 **Phenelzine and psychosis.** *Hawaii Medical Journal.* 35(4):109-111, 1976.

An anxious depressed patient is described who responded idiosyncratically to phenelzine treatment. While never previously psychotic, the woman developed hallucinations and delusions in addition to a confused state usually associated with an organic brain syndrome. Concomitant with psychosis, there were marked changes in the patient's sleep. The phenelzine totally suppressed rapid eye movement (REM) sleep and markedly decreased nonrapid eye movement (NREM) sleep. The patient's insomnia improved following discontinuation of the phenelzine, a monoamine oxidase inhibitor, and her psychotic condition rapidly improved, although some symptoms persisted. It is suggested that the patient's particular spectrum of depression could be related to a similar pathophysiology of schizophrenics who fail to have REM rebounds. It is felt that the mechanisms which normally suppress REM associated events from breaking into NREM and waking in the patient might not have been able to function under the added pressure of total REM suppression and thus disturbed both her NREM and waking life. 18 references.

252653 Bennie, F. H. Leverndale Hospital, Glasgow, Scotland **Recent advances in the drug treatment of the functional psychoses.** *Scottish Medical Journal* (Glasgow). 21(2):79-82, 1976.

Drug treatment of the functional psychoses is discussed and the type and amount of drugs for specific illnesses are recommended. It is noted that the prognosis of the psychoses can be significantly improved when continuous drug treatment is prescribed. The usefulness of chlorpromazine in the control of acute schizophrenia is noted but for chronic schizophrenics, long acting tranquilizers, administered by intramuscular depot injection at intervals of one to four weeks are advised. Patients who have experienced either morbid depression or mania are diagnosed as suffering from an affective psychosis and in the short-term, these illnesses are treated by electroconvulsive therapy, the tricyclic antidepressants, and the tranquilizers. It is pointed out that 40% of patients having one such illness continue to experience further episodes which are likely to become more severe and protracted and for this group, lithium is advised. 5 references.

252760 de Jonghe, F. E. R. E. R., Schalken, H. F. A.; van der Helm, H. J. Department of Psychiatry, Wilhelmina Gasthuis, Eerste Helmersstraat 104, Amsterdam, Netherlands **Thioridazine in the treatment of depressive patients.** *Acta Psychiatrica Scandinavica* (Copenhagen). 53(4):271-276, 1976.

An experimental assessment of thioridazine's effectiveness as a treatment method with depressive patients is reported. In a double-blind study of 44 depressive inpatients, treatment with placebo appeared to give equally good results as did treatment with thioridazine. Both treatment procedures permitted the additional prescription of chlordiazepoxide when the patient's condition indicated the need for anxiety reduction. The use of chlordiazepoxide was more frequently necessary with treatment with placebo than with treatment with thioridazine. 14 references. (Author abstract modified)

252941 Covi, Lino; Lipman, Ronald S.; Alarcon, Renato D.; Smith, Virginia K. Henry Phipps Psychiatric Clinic, 601 North Broadway, Baltimore, MD 21205 **Drug and psychotherapy interactions in depression.** *American Journal of Psychiatry*. 133(5):502-508, 1976.

A series of multiple regression analyses of data from depressed patients was performed. Eight factors consistently predicted treatment response: a lower initial level of distress, imipramine treatment, a positive attitude toward group psychotherapy, and a good employment history predicted lower posttreatment distress levels; estrogen maintenance treatment was related to better response to diazepam, and a low level of intelligence predicted better response to both diazepam and imipramine; and a low initial level of interpersonal sensitivity and a significant other's having an unfavorable attitude toward psychiatric treatment were associated with better response to group psychotherapy. 18 references. (Journal abstract)

252954 Prien, Robert F.; Caffey, Eugene M. Psychopharmacology Research Branch, National Institute of Mental Health, 5600 Fishers Lane, Rockville, MD 20852 **Relationship between dosage and response to lithium prophylaxis in recurrent depression.** *American Journal of Psychiatry*. 133(5):567-570, 1976.

The results of a multihospital collaborative study on the effectiveness of lithium prophylaxis in recurrent depression are analyzed in terms of dosage. Results show that serum lithium levels between 0.5 and 0.7 mEq/liter and doses below 1000 mg/day were relatively ineffective in preventing recurrences. Serum lithium levels between 0.8 and 1.0 mEq/liter and doses above 1000 mg/day were associated with a relatively low failure rate. The relevance of these findings to current prescription guidelines for lithium carbonate are discussed. 14 references. (Journal abstract)

253314 Knezevich, John W.; Biggs, John T. Department of Psychiatry, Washington University School of Medicine, St. Louis, MO 63110 **Do tricyclic antidepressants work?** *Lancet* (London). 1(7963):802-803, 1976.

The effectiveness of tricyclic antidepressants in treating depression is commented upon in a letter to challenging some recent reports which question their value. It is contended that use of strict descriptive diagnostic criteria and recording of severity and duration of the depression play important roles in therapeutic outcome. When these criteria have been followed and plasma levels have been controlled within the suggested therapeutic ranges for both amitriptyline and nortriptyline, patient outcomes are considered positive. The rational use of tricyclic antidepressants is therefore recommended as the treatment of choice for many patients, who benefit from such therapy without requiring hospital admission. Although the number of overdose cases is increasing and fatalities do result, careful monitoring of the patient is seen as reducing mortality. 5 references.

253595 House, Kenneth M.; Martin, Ronald L. Los Angeles County-Univ. of Southern CA Medical Ctr., Adult Psychiatric Outpatient Clinic, 1237 N. Mission Rd., Los Angeles, CA 90033 **MMPI delineation of a subgroup of depressed patients refractory to lithium carbonate therapy.** *American Journal of Psychiatry*. 132(6):644-646, 1975.

Pretreatment variables are correlated with pharmacologic response to study prescriptive efficacy among various types of patients. In a sample of 26 severely depressed hospitalized patients, five patients with low depression and psychasthenia profiles on the Minnesota Multiphasic Personality Inventory (MMPI) did not show an antidepressant response to lithium carbonate, while 17 of 21 depressed patients with high depression and psychasthenia profiles did respond to the antidepressant effects of the drug. It is concluded that by use of the MMPI it is possible to delineate a subgroup of depressed patients who are refractory to lithium carbonate therapy, and to avoid the time consuming, costly, and possibly dangerous medication trial. 8 references. (Journal abstract modified)

253617 Taylor, Michael A.; Abrams, Richard. 9 Covent Place, Hartsdale, NY 10530 **Acute mania: clinical and genetic study of responders and nonresponders to treatments.** *Archives of General Psychiatry*. 32(7):863-865, 1975.

Studies were conducted on the relationships among family history of psychiatric illness, demographic and historical variables, clinical course and presentation, and treatment response for 98 patients satisfying research criteria for mania. Nearly two thirds of the group had excellent responses to somatic treatment, particularly lithium ion, while one third had poor responses to lithium carbonate, neuroleptics, or electric convulsive therapy. Responders frequently exhibited euphoric moods, grandiose delusions, and tended to have cyclothymic premorbid personalities. Nonresponders were found rarely euphoric, frequently exhibited incomplete auditory hallucinations, and tended to have formal thought disorder and depressive/withdrawn premorbid personalities. Responders tended (nonsignificant) to have greater genetic loading for affective illness and alcoholism. A distinction could not be made between the two groups by their age at illness onset, duration of illness, or number of illness episodes per ill patient year. 16 references. (Author abstract modified)

10 DRUG TRIALS IN NEUROSES

243193 v. Petrykowski, W. Universitäts Kinderklinik, D-7800 Freiburg i. Br., Germany /On growth hormone regulation in anorexia nervosa before and after phenothiazine treatment./ *Zur Wachstumshormonregulation bei Anorexia nervosa vor und nach Phenothiazinbehandlung.* *Monatsschrift für Kinderheilkunde* (Berlin). 123(5):340-342, 1975.

Growth hormone regulation in anorexia nervosa before and after phenothiazine treatment is discussed. In acute phases of anorexia nervosa, growth hormone regulation disturbances are observed in the form of increased basal secretion or subnormal secretion capacity, as well as paradoxical reactions to insulin and glucose. High dosage phenothiazine therapy in anorexia nervosa seems to decrease the secretion capacity of insulin and arginine. Optimal nourishment is seen to be the determining factor in the normalizing of growth hormone behavior following chronic hunger. It is concluded that growth hormone regulation disturbances in anorexia nervosa have no prognostic implications. 4 references.

243194 Niederhoff, H.; Wiesler, B.; Kunzer, W. Universitäts-Kinderklinik, Mathildenstrasse 1, D-7800 Freiburg i. Br., Ger-

many /Somatic oriented treatment of anorexia nervosa./ Somatisch orientierte Behandlung der Anorexia nervosa. Monatsschrift für Kinderheilkunde (Berlin). 123(5):343-344, 1975.

The somatic oriented treatment of anorexia nervosa in six girls between 11 and 15 years old who showed signs of severe malnutrition, with phenothiazines and high nourishment feeding is discussed. Psychological examinations revealed the typical personality structures associated with anorexia nervosa. Following stationary treatment, most cases showed significant weight gain along with the resumption of menstruation. In catamnestic psychological examinations 1-3 years later, three of the girls exhibited significant decreases in self-destructive tendencies. 4 references.

244040 Kielholz, P. Psychiatrische Universitätsklinik, Wilhelm-Klein-Strasse 27, CH-4056 Basel, Switzerland /Pharmaceutical therapy of masked depression./ Pharmakotherapie der larvierten Depression. Wiener Medizinische Wochenschrift (Wien). 125(21):327-329, 1975.

Results of an epidemiological survey are cited which indicate that 10% of all patients seeking medical care show depressive characteristics and that 5% of all patients suffer from serious masked depression. It is suggested that masked depression is linked with anxiety and can be effectively controlled by an antidepressant with anxiolytic effects. However, because of side-effects, dosages should be carefully controlled and maintained at the minimal effective level. The primary effects of the common antidepressants in various endogenous depressive syndromes are reviewed, concluding that a combination therapy with maprotiline (Ludomil) and clomipramine (Anafranil), a tetracyclic and a tricyclic antidepressant, respectively, is effective in many cases of masked depression. 15 references.

244349 Smulevich, A. B.; Mazayeva, N. A.; Golovanova, L. A.; Dubnitskaya, E. B. Institut psikiatrii ANM SSSR, Moscow, U.S.S.R. /Differential pharmacotherapy for neurotic states (comparative effectiveness of benzodiazepine derivatives)./ Differentsirovannaya farmakoterapiya nevroticheskikh sostoyaniy (sravnitel'naya effektivnost proizvodnykh benzodiazepina). Zhurnal Nevropatologii i Psikiatrii imeni S. S. Korsakova (Moskva). 76(2):255-262, 1976.

The effectiveness of benzodiazepine derivatives in treating various neurotic disturbances is rated. It is suggested that the effectiveness of treating borderline states depends on whether the disorder is asthenic or sthenic. Tranquilizers are recommended in the treatment of asthenic disorders, but neuroleptics are preferred for the treatment of sthenic states. In order of increasing psychotropic activity, the benzodiazepine tranquilizers are as follows: nitrazepam, chlorthalidoxepoxide, medazepam, oxazepam, diazepam, and lorazepam. 39 references. (Journal abstract modified)

244467 Beda, Eugeniusz. Plac Dietla 3, 34-460 Szczawnica, Poland /Electrophoretic application of lignocaine to the cervical area for the treatment of vegetative neuroses./ Zastosowanie elektroforezy lignokainowej okolicy szyjnej w leczeniu nerwicy wegetatywnych. Wiadomości Lekarskie (Warszawa). 29(7):577-580, 1976.

The application of lignocaine to the cervical area in the treatment of 309 cases of vegetative neurosis is described. Results indicate a positive effect of this procedure in various forms of neurosis, especially in acute anxiety neurosis, vasomotor induced paresthesia in pairs of the extremities, and

carotid sinus syndrome. Observation of over 35,000 applications in treatment of various diseases shows that the method is safer than previously applied treatment methods. 17 references. (Journal abstract modified)

245137 Magnus, R. V. Rubery Hill Hospital, Rubery, Birmingham, England A placebo controlled trial of viloxazine with and without tranquilizers in depressive illness. Journal of International Medical Research (Northampton). 3(3):207-213, 1975.

Two double-blind, four way crossover studies were conducted to compare the antidepressant effect of viloxazine, viloxazine with a tranquilizer (perphenazine or diazepam), or tranquilizer alone, against a placebo. The tests ran for 14 days. Three major conclusions are drawn from the results: that the antidepressant effect of a low dose of viloxazine hydrochloride (150 mg/day) is significantly greater at the end of 14 days of treatment than that of placebo in inpatients and significantly better than diazepam in outpatients; that viloxazine is generally well tolerated and seems to produce only the side effect of a mild upper gastrointestinal disturbance; and that in the treatment of depressed patients with a clear anxiety element, viloxazine alone seems preferable to combination with diazepam or perphenazine, since such combinations may increase the incidence of side effects. 12 references. (Author abstract modified)

245138 Draper, R. St. Patrick's Hospital, Dublin, Ireland Clinical experience with Ro 5-3350 (Bromazepam). Journal of International Medical Research (Northampton). 3(3):214-222, 1975.

A pilot study using Ro 5-3350 (bromazepam) and a double-blind trial comparing Ro 5-3350 and chlorthalidoxepoxide were conducted on 25 patients who were either inpatients or attending an outpatient followup clinic. Each of the patients had a long history of obsessive-compulsive or phobic symptoms. The visual analogue scale, the Taylor Manifest Anxiety Scale and clinical ratings were used to measure response to treatment. On all rating methods, the patients who had received Ro 5-3350, chlorthalidoxepoxide and then Ro 5-3350 in that order, consistently favored Ro 5-3350. The phobic patients all gave favorable responses to Ro 5-3350. Two of the six patients with severe anxiety or agoraphobic states who had been treated with Ro 5-3350 over periods ranging from 3 to 5 years received the medication during a full term of pregnancy and gave birth to full term, normal babies. Results suggest that Ro 5-5530 is a potent anxiolytic most likely to be effective in the relief of visceral manifestations of anxiety. The incidence of side-effects was low and there were no toxic effects reported. 19 references. (Author abstract modified)

246300 Hull, Robert C.; Marshall, J. Allen. Resthaven Psychiatric Hospital and Community Mental Health Center, Los Angeles, CA Single-dose imipramine pamoate in the treatment of depressive neurosis. Psychosomatics. 16(2):84-87, 1975.

A study comparing the efficacy and safety of single dose imipramine pamoate with three daily doses of imipramine hydrochloride in the treatment of patients with depressive neurosis is presented. Results show that a single dose of imipramine pamoate is therapeutically equivalent to a divided dosage of imipramine hydrochloride in treating patients with depressive disorders, and that a single dosage of imipramine pamoate does not predispose the patient to any greater incidence of side effects than may be expected with imipramine hydrochloride. Since patient compliance to drug regimens increases as the number of required doses decrease, it is suggested that single dose imipramine pamoate replace multidose imipramine hydrochloride as a drug regimen. 12 references.

247484 Lapiere, Y. D.; Lee, M. Pierre Janet Hospital, 20 Pharrand St., Hull, Canada Piperacetazine in the treatment of mixed neurotics. *Current Therapeutic Research*. 19(1):105-109, 1976.

Forty neurotic outpatients with anxiety as their presenting symptom were treated in a double-blind procedure with placebo or piperacetazine 10mg t.i.d. There was significant improvement in both groups during the four weeks of treatment. At no time were there significant drug differences demonstrable with a clinical global impression, the Wittenborn Rating Scale, the Hamilton Anxiety Rating Scale, nor the Zung Anxiety and Depression Self Rating Scales. In light of the lack of evidence for the superiority of piperacetazine over placebo, use of piperacetazine as the initial treatment of moderate neurotic anxiety is not recommended. 9 references. (Author abstract modified)

248160 Gillin, J. Christian; van Kammen, Daniel P.; Graves, James; Murphy, Dennis. Laboratory of Clinical Pharmacology, Saint Elizabeths Hospital, Washington, DC 20032 Differential effects of d- and l-amphetamine on the sleep of depressed patients. *Life Sciences (Oxford)*. 17(8):1233-1240, 1975.

A study was undertaken in seven hospitalized depressed patients in order to determine a) the relative effects of acute administration of d-amphetamine and l-amphetamine on human sleep patterns, and b) whether or not these effects of the two isomers would be altered by pretreatment with lithium carbonate. Dextro (d-) and levo (l-) amphetamine produced different EEG sleep changes in depressed patients. Each patient received placebo or one of the isomers (30mg base) at 7:25 a.m. in a double-blind fashion. The patients were studied under two conditions: without treatment with lithium carbonate and with treatment with lithium carbonate (0.9 to 2.1gm/day beginning a minimum of 10 days before study). Both isomers reduced REM sleep and the proportion of total sleep spent in REM (the REM%). No REM rebound was observed on the night following REM suppression. Only d-amphetamine delayed sleep onset and reduced total sleep time, NREM sleep time, and sleep efficiency. The same changes were observed with and without lithium carbonate treatment. 48 references. (Author abstract modified)

248222 Money, J.; Wiedeking, C.; Walker, P.; Migcon, C.; Meyer, W.; Borgaonkar, D. Department of Psychiatry and Behavioral Sciences, Johns Hopkins University and Hospital, Baltimore, MD 21205 47,XY and 46,XY males with antisocial and/or sex-offending behavior: antiandrogen therapy plus counseling. *Psychoneuroendocrinology*. 1(2):165-178, 1975.

Thirteen males with the 47,XY genotype and ten with 46,XY were given the androgen depleting (antiandrogenic) steroid, medroxyprogesterone acetate, in combination with a counseling program. Those with the XY genotype were all sex offenders and those with the XY genotype were antisocial offenders (primarily robbery and destructiveness), with or without sexual offenses. The combined treatment program was beneficial in helping sex offenders to regulate their behavior and, in five instances (three XY and two XYY), there was a remission of paraphilic symptoms. The effect of treatment on aggressive/destructive antisocial behavior was less clear, and was probably due to a placebo like response. 4 references. (Author abstract modified)

248532 Fabre, Louis F., Jr.; Harris, Robert T.; Stubbs, Derek F. University of Texas, Medical School at Houston, Houston, TX Double-blind placebo-controlled efficacy study of ketazolam (U-28, 774). *Journal of International Medical Research (Northampton)*. 4(1):50-54, 1976.

The safety and efficacy of ketazolam (15mg capsules) was compared to placebo in seventy nine outpatients suffering from psychoneurotic anxiety, moderate or worse in severity. A flexible dosage range of 15 to 75mg was used in this double-blind study lasting 28 days. The average optimum therapeutic dose of ketazolam was 46.9mg administered as a once a day dose at bedtime. Ketazolam was found to be significantly better than placebo in alleviating anxiety and its concomitant symptomatology as measured by the Hamilton Anxiety Rating Scale, three Physician's Global Impressions, two Patient's Global Impressions, and three Target Symptoms. Fifteen patients dropped from the placebo group before completion of the study, and two withdrew from the ketazolam group. The patients receiving ketazolam experienced a greater reduction in symptomatology throughout the study when compared to the placebo group. Side-effects experienced by the ketazolam patients were less than, or equal to, the placebo patients. No deleterious side-effects occurred. No differences between the two groups were found for vital signs, EKG's, laboratory tests, or physical examinations. 4 references. (Author abstract)

248955 Kragh-Sorensen, Per; Hansen, Chr. Eggert; Bastrup, Poul Chr.; Hvidberg, Eigill F. Set. Hans Mental Hospital, Department H, DK-4000 Roskilde, Denmark Self-inhibiting action of nortriptyline's antidepressive effect at high plasma levels: a randomized, double-blind study controlled by plasma concentrations in patients with endogenous depression. *Psychopharmacologia (Berlin)*. 45(3):305-312, 1976.

Below the toxic plasma level of nortriptyline (NT) an upper therapeutic limit has been postulated in patients with endogenous depression, and a double-blind randomized study was performed in order to study this problem. Two groups of patients were controlled at different plasma levels. The degree of depression was rated weekly. Only about one third (n=24) of the patients originally included were carried through the full protocol, the most prominent reason for dropout being spontaneous remission during an initial placebo period. After 4 weeks of NT treatment the majority in the high level group was still depressed, but the difference was barely significant (P=5.5%). However, a randomized reduction of the plasma level among the patients at the high level resulted in a significant correlation to remission. Evaluation of the total material after 6 weeks of NT treatment demonstrated a strong correlation of high plasma level to poor antidepressive effect of NT. No correlation could be obtained between side-effects, which were few, and plasma level. The nonproteinbound fraction in plasma was found to be 7% (SD 1.83) by simultaneous determinations of NT in plasma and CSF in 13 patients. The variation in the protein binding was not likely to invalidate the overall results based on total NT determination. A therapeutic plasma range of 50 to 150 ng/ml is recommended. 29 references. (Author abstract modified)

248975 Gilbert, Michael M.; Koepke, Hans H. no address Oxazepam-protriptyline: a double-blind phase II evaluation of the efficacy and safety of the combination versus placebo in neurotic, depressed and anxious psychiatric outpatients. *Current Therapeutic Research*. 18(6):825-838, 1975.

A double-blind placebo controlled evaluation of a combination of oxazepam, 15mg, and protriptyline, 5mg, was conducted with a sample of 100 depressed and anxious outpatients seen in private psychiatric practice. Forty seven patients completed the prescribed four weeks of study. Significant differences were demonstrated between the responses to the therapeutic combination and to the placebo, as measured by several clinical criteria. It is concluded that the combination of

oxazepam and protriptyline is significantly more effective than placebo in the treatment of neurotic depressed and anxious psychiatric outpatients. 9 references. (Author abstract modified)

249771 Peters, Jerome. no address **The neurologist's use of rating scales, EEG, and tranquilizers in dealing with hysterical symptoms.** *Behavioral Neuropsychiatry*. 6(1-12):85-86, 1975.

A study was conducted in an outpatient neurology clinic in an attempt to add to the diagnostic armamentarium and therapeutic effectiveness of the neurologist in dealing with patients complaining of headache and back pain. In the course of one year 20 patients were studied; 10 of these patients had headaches for which no etiology could be found and which did not improve under standard methods of treatment. At the beginning of the treatment year each patient had a 20 min resting EEG and received either 0.6mg/kg chlorpromazine or 0.6mg/kg chlorthalidoxepoxide. The EEG was then continued for 1 hr after the injection. Very slight improvement was noted in ten patients, five patients received significant improvement, and five patients received no improvement on chlorthalidoxepoxide. On chlorpromazine, 16 patients experienced marked improvement and four patients experienced some improvement. It is concluded that use of major tranquilizers may be needed to keep hysterical symptomatology under control while diagnostic investigation is proceeding and, if the diagnostic studies are negative, may be used to help ameliorate symptoms in patients unwilling to see a psychiatrist. 16 references. (Author abstract modified)

250491 Stevenson, James; Burrows, Graham D.; Chiu, Edmund. Parkville Psychiatric Unit, 35-37 Poplar Road, Parkville, Victoria 3052, Australia **Comparison of low doses of haloperidol and diazepam in anxiety states.** *Medical Journal of Australia* (Sydney). 1(13):451-452, 1976.

A clinical comparison of the antianxiety effects of haloperidol and diazepam made in a psychiatric outpatient population is reported. Patients matched for age, sex and three target symptoms, were given 0.33mg of haloperidol or 5mg of diazepam three times a day for 21 days. Severity of symptoms was assessed by the Hamilton Rating Scale for anxiety and the Taylor Manifest Anxiety Scale. Both drugs were found to be highly effective in reducing anxiety symptoms with few and mild side-effects of diminishing intensity during the trial period. 9 references. (Author abstract modified)

250516 Kellner, Robert; Freese, Martin L.; Rada, Richard T.; Wall, Francis J. Department of Psychiatry, School of Medicine, University of New Mexico, Albuquerque, NM 87106 **A pilot study of the short-term psychotropic effects of GPA 2640.** *Journal of Clinical Pharmacology*. 16(4):194-197, 1976.

Thirty two anxious nonpsychotic inpatients participated in a four day, double-blind repeat crossover study of a new drug GPA 2640 and placebo, to examine dose tolerance, side-effects and antianxiety effects during one day treatment. Individually adjusted doses ranged between 1100 and 1300mg daily. Observer rating and self-rating scales were used, yielding somewhat lower scores on drug days than placebo days, but differences were not significant. Two patients developed temporary paranoid delusions which may have been drug related and two patients had raised SGOT levels after the study. There were no significant differences in vital signs. The results indicate that the drug has no immediate antianxiety effects, but this does not preclude the possibility of delayed anxiolytic or other delayed psychotropic effects. 6 references. (Author abstract modified)

250727 Hafner, Julian; Marks, Isaac. Institute of Psychiatry, Maudsley Hospital, London, England **Exposure in vivo of agoraphobics: contributions of diazepam, group exposure, and anxiety evocation.** *Psychological Medicine* (London). 6(1):71-88, 1976.

An examination of three variables affecting the outcome of exposure in vivo, and a method of relieving phobic and obsessive-compulsive disorders, are presented. The three variables examined were the contribution of diazepam, the value of exposure in groups, and the role of anxiety. Fifty seven chronic agoraphobic outpatients were treated by 12 hours of exposure in vivo on 4 days over 2 weeks to check the effects of oral diazepam versus placebo during group exposure, group versus individual exposure, and high versus medium anxiety arousal during individual exposure. The controlled parallel design allowed comparative evaluation of each treatment condition to 6 months followup. Assessment was blind with respect to drug and psychological treatment. Patients in all treatment conditions improved significantly in phobias and in related life areas. Outcome to group exposure on phobias and other measures was similar in all three drug conditions (placebo, waning diazepam, peak diazepam) with no significant differences between them. Diazepam patients had significantly less discomfort than placebo patients during group exposure treatment. Group exposure patients improved slightly but significantly more than individual exposure patients on nonphobic measures, though group exposure was accompanied by more panics during treatment yet was easier to run by the therapist. Individual exposure under high anxiety arousal was no more therapeutic than with lower anxiety. It is noted that diazepam is a mild palliative during group exposure but does not facilitate outcome to treatment. It is concluded that group exposure in vivo is mildly facilitatory for outcome compared with individual exposure. Anxiety evocation during treatment was not found to be therapeutically helpful. 19 references. (Author abstract modified)

251004 Elwan, Osamah; Souief, Mostafa; Hassan, Mahassen Aly; Allam, Mahmoud. Cairo University, Cairo Egypt **Psychometric assessment of the therapeutic efficiency of antidepressant agents.** *Journal of International Medical Research* (Northampton). 4(2):118-124, 1976.

A psychometric assessment of the therapeutic efficiency of three antidepressant agents is reported. Thirty depressed patients, aged between 20 and 34, years were divided into 3 groups of 10 patients each. One group received amitriptyline, the second group was administered nortriptyline and the third group was given dibenzepine. All drugs were administered orally for four weeks. Patients were submitted to psychometric testing before and after drug administration. The tests used including the Hamilton Rating Scale for Depression, the Hildreth Feeling Scale, the D Scale from Guilford's Inventory of Personality Factors STDOR and the Trail Making Test for the evaluation of psychomotor retardation. Amitriptyline was found to be mostly anxiolytic; nortriptyline controlled both depression and anxiety to approximately the same extent; and dibenzepine was found to be a mood elevating drug with an energizing action. 15 references. (Author abstract modified)

251005 Valentine, M. Glenside Hospital, Stapleton, Bristol, England **A profile for trimipramine.** *Journal of International Medical Research* (Northampton). 4(2):125-127, 1976.

A study to assess the efficacy of trimipramine as an antidepressant is presented. A series of 61 patients with depressive symptoms were treated with trimipramine in single nightly dosages. Analysis of the data indicated that a favorable out-

come was likely to be associated with the following features: absence of gastrointestinal complaints; absence of hypochrondriasis; a level of anxiety not more than the average for psychiatric patients; absence of situational palpitation; possession of a stable work record; and possession of a family history positive for psychiatric disorder. These features are not claimed to be specific to treatment with trimipramine. Age, sex, outpatient status, inpatient status and the overall degree of depression were not found to be relevant. Trimipramine was associated with a favorable outcome in 64% of all cases treated, and 73% of primarily depressive conditions. 7 references. (Author abstract modified)

251156 Silverstone, T. St. Bartholomew's Hospital, London, England Report of a symposium on beta-adrenergic receptor blockade in psychiatry, held in Ferndown, Dorset, on June 21st 1975. Beta-adrenergic blocking drugs in anxiety. *Scottish Medical Journal* (Glasgow). 20(6):281-282, 1975.

The question of whether anxiety itself may be reduced by reducing the accompanying tachycardia is discussed with reference to studies on the effects of propranolol and oxprenolol in blocking beta adrenergic receptors in the heart. Although these beta blockers were observed to reduce autonomic symptoms associated with persistent anxiety and acute situational anxiety, evidence of consistent effectiveness was found only for the latter type. Studies are cited in which oxprenolol was found to reduce psychogenic tachycardia associated with ski jumping, racing car driving, and public speaking; in the latter case, a lowering of anxiety was observed. Implications for the management of phobias are discussed. 8 references.

251157 Tyrer, P. General Hospital, Southampton, England A practical classification of morbid anxiety. *Scottish Medical Journal* (Glasgow). 20(6):283-284, 1975.

Considerations in treating morbid anxiety are briefly discussed, stressing that the disorder must be analyzed in its somatic and psychic categories before deciding upon the course of treatment. It is contended that treatment of the psychically oriented (psychergastic) anxious patient should be psychological in nature, or, if pharmacological, should involve a centrally acting drug such as benzodiazepine. In the somatically oriented (somatergastic) patient who may not complain primarily of subjective anxiety and is frequently diagnosed as having a functional disorder, psychological treatments are outweighed by symptom directed approaches. Beta adrenoceptor blocking drugs appear as effective as benzodiazepines in relieving cardiovascular and respiratory symptoms and those due to increased tremor. Research indicates that there is little to choose between different blocking agents, and that selection of the right patient for such treatment is more important. Separating morbid anxiety into somatic and psychic categories is seen as helping the clinician in making his choice. 10 references.

251158 Gains, R.; Suri, A. K.; Thompson, J. Department of Psychiatry, Guy's Hospital, London, England Use of beta blockers as an adjunct in behavioural techniques. *Scottish Medical Journal* (Glasgow). 20(6):284-286, 1975.

A study was conducted to determine the effectiveness of the beta blocker oxprenolol in reducing the somatic concomitants of anxiety generated in patients with specific phobias undergoing treatment with prolonged exposure, and to determine whether the drug interfered with new learning or relearning processes. During the treatment session patients were gradually presented to the object of their phobias and were

given in random order either 160mg oxprenolol or a matching placebo capsule. Results reveal that oxprenolol was effective in suppressing the increase in heart rate during the treatment. However, fear and avoidance series at the end of treatment were considered paradoxical in that the patients receiving placebo scored lower than those given oxprenolol, suggesting that a dose of 160mg oxprenolol may have a central depressing effect which in turn depressed learning. Further work is in progress to evaluate the usefulness of this group of drugs.

251159 Elsdon-Dew, R. W. CIBA Laboratories, Horsham, Sussex, England Clinical trials of oxprenolol in anxiety. *Scottish Medical Journal* (Glasgow). 20(6):286-287, 1975.

Clinical research on the use of oxprenolol, a beta adrenergic blocker, in treating anxiety, tension and overall negative feelings of well-being is briefly reviewed. Studies with anxious presurgery patients, and with patients exhibiting symptoms of the climacteric indicate that the drug, irrespective of dosage level, was effective in easing anxiety and tension, improving overall feelings of well-being, and alleviating some psychosomatic complaints. Diazepam, a nonblocking agent, was also effective. It is concluded that careful individual consideration of diagnostic differences in patient requirements is necessary, after which beta adrenergic blocking drugs can be applied in cases of increased autonomic activity. 1 reference.

251160 Krishnan, G. Student Health Service, University of Leicester, England Oxprenolol in the treatment of examination nerves. *Scottish Medical Journal* (Glasgow). 20(6):288-289, 1975.

Research on the use of oxprenolol, a beta adrenergic blocker, to alleviate test anxiety in college students is briefly reviewed. Use of 40mg of the drug twice daily, as compared to use of 20mg diazepam twice daily, indicated that both treatments were equally effective in reducing feelings of anxiety and tension. Students perceived more improvement with diazepam, however. Comparison of actual results with predicted ones showed that the oxprenolol groups performed significantly better, suggesting that diazepam caused an unjustifiable increase in confidence. It is concluded that oxprenolol may be beneficial for treating persons who face stressful situations that require unimpaired cerebral function.

251161 Carruthers, M. St. Mary's Hospital, London, England Worrying about anxiety. *Scottish Medical Journal* (Glasgow). 20(6):289-290, 1975.

The effectiveness of beta adrenergic blocking drugs in treating anxiety is briefly discussed. Research is cited which indicates that acute situational anxiety reaction may be self-perpetuating (a spiraling sequence of anxiety, adrenaline secretion and learned sympathomimetic symptoms) and that it might be altered by drug induced changes in autonomic activity. Encouraging results have been obtained in reducing the psychogenic tachycardia associated with ski jumping, race car driving, and public speaking; implications for treatment of phobia are noted.

251165 Hawkins, J. R. North Tees General Hospital, Stockton-on-Tees, England Clinical experience with beta-blockers in consultant psychiatric practice. *Scottish Medical Journal* (Glasgow). 20(6):294-298, 1975.

Clinical experience with beta adrenergic blockade in managing anxiety syndromes in consultant psychiatric practice is briefly reviewed. Use of various dosages of oxprenolol and propranolol with patients suffering from mental or phobic anx-

ity, anxiety with depression, or physical anxiety suggests that they are useful in a large, unselected and varied series of patients. Clinical improvement was obtained in nearly 75% of patients able to tolerate the drugs, and though some patients were not, the frequency and severity of side-effects did not constitute a major problem. The most effective dose was 120mg per day of either oxprenolol or propranolol. Patients with physical anxiety improved more than those with mental anxiety, but a number of the latter responded favorably, as did some phobics and anxiety/depression subjects. In many cases it was possible to withdraw alternative anxiolytics cautiously and progressively once beta blocker therapy had been established.

251985 Johnstone, Eve C. Division of Psychiatry, Clinical Research Centre, Watford Road, Harrow, Middlesex HA1 3UJ, England *The relationship between acetylator status and inhibition of monoamine oxidase, excretion of free drug and antidepressant response in depressed patients on phenelzine.* *Psychopharmacologia* (Berlin). 46(3):289-294, 1976.

A study was designed to examine the hypothesis that phenelzine is metabolized by polymorphic acetylation and that its effects are dependent on acetylator status. Thirty depressed inpatients were given a 3 week course of phenelzine 30mg t.i.d. The antidepressant effect, the degree of inhibition of monoamine oxidase and the amount of free phenelzine excreted in the urine were all significantly greater in slow acetylators than in fast. These findings strongly support the hypothesis. 31 references. (Author abstract)

252447 Boszormenyi, Z. National Institute for Nervous and Mental Diseases, Budapest, Hungary *Clinical and therapeutical problems of mild (non-psychotic) mental depressions.* *Therapia Hungarica* (Budapest). 23(4):147-152, 1975.

Findings of several studies conducted to evaluate the use of Grandaxin in nonpsychotic depression are presented along with a brief general discussion of symptoms and treatment of the disorder. Fifty six patients with minor psychiatric conditions were tested for ego strength by the Barron scale before and after treatment with Grandaxin. Weakened ego strength could not be recorded, contrary to observations with previously used tranquilizers. Grandaxin was also successfully applied to 70 nonpsychotic patients for 14 to 50 days. Fifty percent of the patients became symptom free and 34% showed improvement. The use of Grandaxin is recommended as a single agent in the treatment of mild depression and as adjuvant in lithium preventive treatment. 17 references.

11 DRUG TRIALS IN MISCELLANEOUS DIAGNOSTIC GROUPS

242868 Vigeland, Kari. Psykiologisk Institutt, Universitetet i Oslo, Oslo, Norway *Changes in the personality functioning of psychotics with neuroleptic treatment.* / Forandringer i personlighetsfungering ved neuroleptika-behandling av psykotikere. *Nordisk Psykologi* (Kobenhavn). 27(4):238-245, 1975.

Nine psychotic patients were tested on admission and retested after 8 weeks of optimal doses of neuroleptics with the Raven Progressive Matrices, GGWS Object Sorting Test, and the Rorschach. Statistically significant score changes were registered on the two latter tests. The importance of the tests' structural complexity to activation of cognitive disturbance is emphasized. It is suggested that disturbances in perceptual organization and thought are related to psychopathologies of dissimilar nature and resistance. Comprehensive evaluation of changes in personality functioning from Rorschach responses

indicated qualitatively different directions of change which could be related to the initial pathology. 10 references. (Journal abstract modified)

242898 Damamme, P.; Berteau, P.; Bouvier, J.; Collet, A.; Lerisson, J.-A. no address *Adaptiveness and behavior of the elderly subject.* / Adaptivite et comportement due sujet age. *Revue de Gerontologie d'Expression Francaise* (Paris). January:5-11, 1976.

Forty three elderly subjects suffering from arterial degeneration were treated with Hydrosarpan-711 for 6 months. With respect to intellectual efficiency determined by psychometric tests, 60% of the Ss showed improvement of at least 50%; 20% improved between 25% and 49%; and 20% improved less than 25%. Global results were very favorable in 63%; the remaining 37% were equally divided between improvement and stabilization. Tolerance of the drug was excellent. It is concluded that administration of Hydrosarpan-711 results in objective improvement of mental efficiency.

242899 Brochier, F. Fondation de Rothschild, 76, rue Picpus, 75012 Paris, France *The quality of intellectual life: double-blind study of Hydrosarpan-711 involving 80 subjects.* / La qualite de la vie intellectuelle: etude en double aveugle d'Hydrosarpan 711 portant sur 80 sujets. *Revue de Gerontologie d'Expression Francaise* (Paris). January:13-16, 1976.

A double-blind study of Hydrosarpan-711, administered to 80 elderly Ss for 6 months, is reported. Tolerance was excellent; only one patient out of 50 had to stop treatment due to the appearance of vertigo. The results confirm the effectiveness of Hydrosarpan-711. Improvement was observed in 37 of the 50 patients on all tests, principally on those concerning general intelligence. For tests evaluating general memory improvement was minimal but significant in relation to the notable decrease in these functions for subjects taking the placebo. In addition, treatment contributed to the elderly patients' sense of well-being through disappearance of a number of subjective disturbances such as vertigo, ear buzzing and lightheadedness.

242900 Huguet, R. Hospice Despagne, Versailles, France *Behavior and intellectual activity of the elderly: double-blind study of Hydrosarpan-711 in a hospice environment.* / Comportement et activite intellectuelle des personnes agees: etude en double aveugle d'hydrosarpan 711 en milieu d'hospice. *Revue de Gerontologie d'Expression Francaise* (Paris). January (Special Issue):19-24, 1976.

A double-blind study of the effects of Hydrosarpan-711 on behavior and intellectual activity in 38 elderly patients is reported. With respect to participation in the life of the center in which they were hospitalized, two good results, two moderate results, and six null results were obtained with Hydrosarpan-711, compared with three moderate results and 15 null results with placebo. Eleven good results and nine null results were obtained with Hydrosarpan-711 with respect to the routine of daily life, compared with five moderate and 13 null results with placebo. Eleven good results, three moderate results, and six null results were obtained with Hydrosarpan-711 with respect to mood, sleep and interpersonal relations, compared with three moderate and 15 null results with placebo. It is concluded that Hydrosarpan-711 is particularly effective in memory and behavior disturbances.

243180 Ruhland, W.; Wernecke, O. Krankenpflegeheim, 1631 Saalow, Kreis Zossen, Germany *The clinical effectiveness of a calcium-magnesium-oxalate combination in nursing home patients*

in a double-blind study./ Überprüfung der klinischen Wirksamkeit einer Kavain-Magnesium-Orotat-Kombination an Heimbewohnern eines Krankenpflegeheimes in einer doppelten Blindstudie. Zeitschrift für Altersforschung (Dresden). 29(3):311-323, 1975.

Results of a double-blind study of the clinical effectiveness of the active substance combination cavain/magnesium/orotate in 276 patients over a period of 5 months are analyzed statistically and presented graphically. Patients had an average age of 75 years, and exhibited similar geriatric polymorbidity profiles. A significant general improvement in physical and mental ability was observed, and hematological, biochemical, and serological examinations revealed no toxic effects. The preparation had no effect on the blood sugar levels of diabetics. 17 references. (Journal abstract modified)

243198 Argyropoulos, G.; Lanner, G.; Pasquali, E. Universitätsklinik für Neurochirurgie, Auenbruggerplatz 1, A-8036 Graz, Austria /Clinical and electroencephalographical studies of the new hypnosedative K-2004./ Klinische und elektroenzephalographische Studien mit einem neuen Hypnosedativum K-2004. Wiener Medizinische Wochenschrift (Wien). 126(6):75-77, 1976.

A clinical trial in 144 neurosurgical patients with the preparation K-2004 (Biglumid, 2-(bicyclo-heptane-2-endo-3-endo-dicarboxamide)-glutaramide) is presented. Results indicate that K-2004 is an effective hypnosedative and is a useful presurgical medication. A tranquilizing and sedative effect was observed in 82.2% of patients given a single dose of 200mg. Clinical observations were confirmed objectively through electroencephalographic studies. A doubling of the dose to 400mg resulted in no observed increase in effect. No negative side-effects were observed. 21 references.

243869 Craddock, Denis. 59 Warham Road, South Croydon CR2 6LH, England /Anorectic drugs. Current Therapeutics. 17(2):71,73-75, 77-78, 81, 83-87, 1976.

The properties of anorectic drugs and their use in the management of obesity are discussed. Anorectic drugs act mainly on the satiety center in the hypothalamus to produce anorexia. Most of the drugs are related directly or indirectly to amphetamine. All the drugs, with the exception of fenfluramine, have a stimulant effect on the central nervous system in some individuals, resulting in restlessness and nervousness, irritability and insomnia. Dexamphetamine, phenmetrazine, and benzphetamine all tend to cause euphoria and the risk of addiction is considerable. Side-effects also occur due to sympathetic stimulation and gastrointestinal irritation. The anorectic drugs have a very definite part to play in the treatment of obesity, mainly for those individuals who have altered their eating habits but have come to a plateau of weight which they find difficult to get below. The drugs are best given in a long-acting form and can safely be continued as long as weight loss persists. Diethylpropion emerges as the drug of choice as the other drugs exhibit a wide range of undesirable side-effects. (Author abstract modified)

244045 Niessner, G. Institut für Anesthesiologie der Universität, Spitalgasse 23, A-1090 Vienna, Austria /Narcosis introduction with flunitrazepam in accident surgery./ Narkoseeinführung mit Flunitrazepam in der Unfallchirurgie. Wiener Medizinische Wochenschrift (Wien). 125(21):350-351, 1975.

A clinical study of the effectiveness of flunitrazepam (Rohypnol) in the anesthesia of accident patients is discussed. A total of 34 surgical patients was divided into two groups fol-

lowing flunitrazepam narcosis. The first group was given a gas mixture of 25% oxygen and 75% nitrous oxide; the second group breathed normal air. In the first group, oxygen pressure remained above the normal levels, and in the control group, oxygen pressure dropped an average of 15%. Systolic blood pressure increased in both groups, and diastolic blood pressure and heart rate showed no significant changes. 11 references.

244107 Rustin, Terry A. 3725 N. Tres Lomas Place, Tucson, AZ 85715 /Diagnosis and management of ethanol withdrawal syndromes. Arizona Medicine. 33(4):282-287, 1976.

The diagnosis and management of ethanol withdrawal syndromes are discussed. Minor and major withdrawal syndromes are differentiated, and differential treatment is recommended. It is suggested that oral chloral hydrate be administered for minor withdrawal syndromes, and that patients exhibiting major ethanol withdrawal be admitted to a hospital and treated with intravenous chlordiazepoxide; hypermetabolic factors and concomitant disease must also be treated.

244136 West, James W. W.A. Surgical Associates, SC, 2400 95th St., Evergreen Park, IL /Alcoholism: a general hospital meets the challenge. Maryland State Medical Journal. 25(5):73-76, 1976.

A program for the care of alcoholism patients put into operation at the Little Company of Mary Hospital, Evergreen Park, Illinois, is described. The treatment program is an organized, multidisciplinary diagnostic and therapeutic system. Care is based on the phase of alcohol withdrawal that is exhibited by the individual patient; patients are administered with either hydroxyzine, chlorpromazine, haloperidol, or diazepam, depending on the stage of withdrawal. The effects of withdrawal on central nervous system, fluid and electrolyte balance, and abnormal glucose metabolism are considered in prescribing treatment. Psychosocial therapy, which begins on admission to the hospital, includes group therapy, Alcoholics Anonymous (AA) meetings, psychometric testing, and Saturday workshops for patients and expatients. Aftercare is arranged through the local AA chapter, and professional counseling or outpatient care in an alcoholism rehabilitation center are recommended. 8 references.

244298 Capone, Thomas; Brahen, Leonard S.; Wiechert, Victoria. Dept. of Drug and Alcohol Addiction, Nassau County, NY /Personality factors and drug effects in a controlled study of cyclazocine. Journal of Clinical Psychology. 32(2):489-495, 1976.

The relationship between measurable personality factors and level of effects shown to cyclazocine and placebo was investigated in a controlled study. An attempt was also made, through case analysis, to examine the association between dynamic aspects of personality and adverse drug effect. Hysteria scores on the Minnesota Multiphasic Personality Inventory (MMPI) were found to be related significantly to self-reported effects under both the drug and placebo conditions. Clinical observations were examined retrospectively for three cases with adverse reactions and cited to support a dynamic theory that associated drug reactivity to personality factors. 10 references. (Author abstract)

244450 Oury, M.; Collignon, P. Université de Liège, Institut de Médecine, Dept. de Clinique et de Sémiologie médicales, Liège, Belgium /Use of injectable lorazepam in preparation for cardiac catheterization./ Utilisation du lorazepam injectable dans la préparation au cathétérisme cardiaque. Revue Médicale de Liège (Liège). 31(3):88-90, 1976.

Lorazepam was compared with promethazine penthiadine in preparing 30 adult patients for cardiac catheterization. Fifteen of the Ss received 5mg lorazepam i.m., and the others received 50mg promethazine and 100mg pethidine i.m. Lorazepam had a less marked sedative effect than the promethazine/pethidine combination. Lorazepam did not involve any side-effects such as nausea and vomiting, and had no significant effect on the cardiovascular system. Three patients treated with lorazepam complained of significant pain, while only one patient treated with promethazine/pethidine experienced pain. It is concluded that lorazepam is preferable to the promethazine/pethidine association in preparing patients for cardiac catheterization. Its principal advantage is the absence of side-effects. 4 references.

244451 Oury, M.; Collignon, P. Universite de Liege, Institut de Medecine, Liege, Belgium /The use of injectable lorazepam in preparation for electric cardioversion./ Utilisation du lorazepam injectable dans la preparation a la cardioversion electrique. *Revue Medicale de Liege* (Liege). 31(3):85-87, 1976.

The use of injectable lorazepam in preparation for electric cardioversion was investigated, and lorazepam was compared with diazepam. The reactions of 20 adult patients of both sexes who underwent cardioversion for chronic auricular fibrillation were investigated. Ten patients received 10mg i.v. of diazepam, while the other ten patients received 2.5mg lorazepam per os and 5mg i.v. 2 hours later. Although in most cases the electric shock was applied when the patient was awake, the memory of the pain was scarcely more frequent in Ss treated with lorazepam than for the patients treated with diazepam who were mostly sleeping. This is due to lorazepam's effect on memory. Lorazepam should be associated with a powerful analgesic, however. Lorazepam has the following advantages with respect to diazepam: dosage is standardized; the patient is usually awake and cooperative; with the doses used, there are no disturbances in consciousness and no respiratory disturbances. 8 references.

244476 Facchini, G.; Anzivino, F.; Autore, A.; Bertoncelli, R.; Semeraro, S. Ospedale Provinciale Specializzato 'M. Malpighi', Bologna, Italy /Clinical findings in diseases in the elderly with a clear psychogenic component with particular respect to their pharmacological treatment./ Rilievi clinici nelle affezioni dell'eta senile con chiara componente psicogena e con particolare riguardo al loro trattamento farmacologico. *Giornale di Gerontologia* (Firenze). 23(11):919-926, 1975.

The psychological components of illnesses in the elderly are discussed, based on clinical findings. The range of illnesses includes anxiety, depression, neurasthenia, obsessivephobic syndromes, somatizations, and organic diseases with psychic components. In treating these illnesses, close collaboration between specialists in geriatrics, psychiatry and psychology is recommended. Results that have been obtained with sulpiride in the treatment of dizziness, headache, tics, tremors, functional cardiac disturbances, and psychogenic dermatoses are reported. Satisfactory results obtained with depression, and profound anxiety, anorexia with a psychic component, and epigastralgia from peptic ulcer and duodenitis are also cited. The drug is effective when administered alone or in association with other drugs (imipramine, diazepam, or oxazepam). 20 references. (Journal abstract modified)

244686 Vogel, Gerald W.; Barker, Katherine; Gibbons, Pauline; Thurmond, Arthur. Sleep Laboratory, GMH, 1256 Briarcliff Road, N.E., Atlanta, GA 30306 A comparison of the effects of flurazepam 30 mg and triazolam 0.5 mg on the sleep of insomniacs. *Psychopharmacology* (Berlin). 47(1):81-86, 1976.

The effects of oral, bedtime triazolam 0.5mg and flurazepam 30 mg, on the laboratory sleep of 12 insomniacs were compared in a double-blind, crossover study. A 22 consecutive night schedule was used. Effects on sleep were assessed objectively by conventional electroencephalogram/electrooculogram/electromyogram sleep recordings and subjectively by questionnaires administered each morning. Side-effects or toxic effects were assessed by physical exams, clinical lab tests, and twice daily questionnaires. During their administration, the two drugs were practically indistinguishable in their effects. Both significantly reduced objective and subjective measures of insomnia, such as total wake time and sleep latency. On discontinuation, the drugs differentially affected sleep: on the first postflurazepam night, total sleep time was significantly more than baseline whereas on first posttriazolam night, total sleep time was significantly less than baseline. There were no remarkable side-effects or toxic effects with either drug. 12 references. (Author abstract modified)

244958 Sallou, Cl. Hopital St-Joseph, 7, rue Pierre-Larousse, F 75674 Paris Cedex 14, France /Study of the tolerance and clinical effect of carbamazepine in a new suspension in 38 children and adolescents from 2-18 years old, affected with epilepsy sometimes associated with behavior and character./ Etude de la tolerance et de l'action clinique de la carbamazepine sous une presentation nouvelle de suspension chez 38 enfants et adolescents, ages de 2 a 18 ans, atteints d'epilepsie associee parfois a des troubles du comportement et du caractere. *Revue de Neuropsychiatrie Infantile* Etc. 23(8-9):619-624, 1975.

The tolerance and clinical effect of carbamazepine (Tegretol) administered in a new suspension was investigated in 38 epileptic children and adolescents. Dosage varied according to age and ranged from 300-600mg per day. Tolerance was good in 31 of 36 observations, but undesirable transitory side-effects were observed in over one third of the cases in the form of diurnal somnolence. The clinical effect was excellent or good in 12 cases of epilepsy out of 19 observations, with a distribution of the effect according to the forms of epilepsy comparable to that of carbamazepine tablets. In comparison with carbamazepine tablets, the therapeutic effect of the suspension appears equal or superior with sometimes smaller daily doses; and the psychotropic effect of the suspension is recovered with equal constancy in behavioral disturbances. Carbamazepine can replace phenobarbital in long-term treatment of convulsions in infancy whenever signs of intolerance to phenobarbital are observed. 1 reference.

245136 Gallegos-Torres, Juan; Flores-Mercado, Francisco. Centro Gineco-Pediatrico Privado, Sinaloa 106 8 Piso, Mexico 7, DF Isoxsuprine in primary dysmenorrhea: its effectiveness in premenstrual tension. *Journal of International Medical Research* (Northampton). 3(3):194-201, 1975.

The effectiveness of a combination of acetaminophen (250mg) and caffeine (30mg) with isoxsuprine (10mg) in the relief of symptoms of primary dysmenorrhea with or without premenstrual tension was evaluated in a study of 80 women with dysmenorrhea. The overall percentage of very good to excellent results was 93.75% of the subjects. Results indicate that this drug combination, administered orally, is effective in relieving the symptoms of intrinsic or primary dysmenorrhea and of premenstrual tension. A general discussion of the findings is presented in relation to age, civil status, time of appearance of dysmenorrhea, nature of pain, accompanying symptoms, previous treatment, other nondrug therapies, results obtained, time within which symptoms were alleviated, total use of the drug and side effects. 13 references. (Author abstract modified)

245235 Rajput, A. H.; Rozdilsky, B. University Hospital, Saskatoon, Saskatchewan, Canada *Parkinsonism and dementia: effects of levodopa*. *Lancet* (London). No. 7915:1084, 1975.

In a letter to the editor, studies on parkinsonism and dementia with respect to the effects of levodopa are reported. Mental function evaluations and electroencephalograms were obtained in 125 parkinsonian patients before treatment with levodopa. Thirty five patients had dementia of some degree, and the electroencephalogram was abnormal in 83 patients before treatment. Two thirds of the patients showed significant improvement in parkinsonism and the electroencephalograph returned to normal in 23% on levodopa. Patients with dementia and abnormal electroencephalograph activity had no significant clinical or electroencephalographic improvement. It is concluded that most patients with moderate to severe dementia have absent alpha activity and excess slow wave activity, and that such patients will show little improvement in mental function on levodopa therapy. It is recommended that an electroencephalogram be made in all cases of parkinsonism who have significant dementia to predict the response of mental function to levodopa therapy. 6 references.

245344 Barnes, S. E.; Bower, B. D. Department of Paediatrics, John Radcliffe Hospital, Headington, Oxford OX3 9DU, England *Sodium valproate in the treatment of intractable childhood epilepsy*. *Developmental Medicine and Child Neurology* (London). 17(2):175-181, 1975.

The use of sodium valproate in combination with a variety of standard anticonvulsant drugs is evaluated as a treatment for childhood epilepsy. A reduction of fit frequency greater than 90% was obtained in six patients, and a reduction of over 50% in another six, with an improvement in alertness and school performance in the majority of cases. Grand mal, myoclonic and petit mal epilepsy gave the best response, while infantile spasms responded least well. No serious side-effects were encountered. Dosimetry and implications for treatment are discussed. 13 references. (Author abstract modified)

245469 MacPhail, I.; Ogilvie, A.; Purvis, C. R. no address *The prescribing of hypnotics in general practice*. *Journal of International Medical Research* (Northampton). 3(1):49-52, 1975.

A trial is undertaken to convert patients who are habitual users of barbiturates or Mandrax to flurazepam. Results show that 45 of the 57 patients (78.9%) were converted within a period of 2 to 5 weeks. Three typical case histories are given as illustrations. It is concluded that the flurazepam was well tolerated and apart from the metallic taste reported by four patients, no other side-effects were reported. 9 references. (Author abstract modified)

245649 Rickels, Karl; Gingrich, Russell L., Jr.; Morris, Richard J.; Rosenfeld, Howard; Perloff, Milton M.; Clark, E. L.; Schilling, Ann. 203 Piersol Bldg., 3600 Spruce St., Philadelphia, PA 19104 *Triazolam in insomniac family practice patients*. *Clinical Pharmacology and Therapeutics*. 18(3):315-324, 1975.

A 0.5mg dose of triazolam, a benzodiazepine with hypnotic properties, was compared to 100mg secobarbital and placebo in a 1 week study of 100 insomniac family practice patients. Considerable sensitivity to differential treatment effects was demonstrated. In almost all sleep parameters, assessed with a variety of subjective techniques, triazolam and secobarbital were significantly more effective than placebo. Triazolam was consistently and often significantly a more effective hypnotic, particularly for reducing nocturnal awakening, than secobarbital. Analysis of self-report emotional distress data revealed

that present insomniac patients were slightly more emotionally symptomatic than other nonpsychiatric populations. Triazolam was followed by the greatest and secobarbital the least relief of emotional symptoms, and triazolam emerged as an especially effective hypnotic for initially more depressed insomniac patients. Findings suggest that type and degree of emotional symptomatology may affect the response of insomniac patients to hypnotics. 12 references. (Author abstract modified)

245652 Kales, Anthony; Kales, Joyce D.; Bixler, Edward O.; Scharf, Martin B. Sleep Research and Treatment Ctr., Penn. State Univ., Milton S. Hershey Medical Ctr., Hershey, PA 17033 *Effectiveness of hypnotic drugs with prolonged use: flurazepam and pentobarbital*. *Clinical Pharmacology and Therapeutics*. 18(3):356-363, 1975.

The effectiveness of hypnotic drugs under conditions of prolonged use was assessed using 30mg flurazepam and 100mg pentobarbital administered to 10 insomniac Ss. Flurazepam was found to be effective in inducing and maintaining sleep over all treatment conditions. With long-term use, only a slight loss of effectiveness was suggested. It also produced a moderate decrease in rapid eye movement (REM) sleep and marked decrease in eye movement density and stage 4 sleep with short-term and intermediate-term use. While decreases in both REM sleep and eye movement density lessened with long-term use, stage 4 sleep remained markedly suppressed. No rebound was noted in any parameter after withdrawal. Pentobarbital was found to be effective in inducing and maintaining sleep only with short-term administration, suggesting that it is of limited value for insomniac patients requiring nightly medication. Pentobarbital caused a minimal decrease in REM sleep with short-term and intermediate-term administration, and slight rebound following withdrawal. Stages 3 and 4 were decreased with short-term use and increased above baseline levels after withdrawal. The relative ineffectiveness of pentobarbital is stressed. (Author abstract modified)

245884 Singh, S. B. G.S.V.M. Medical College, Kanpur, India *Effects of drugs on epileptic patients*. *Indian Journal of Applied Psychology* (Madras). 12(1):9-12, 1975.

Some effects of anticonvulsant drugs on the mental abilities of epileptics were examined by means of psychological testing. The sample of 60 epileptics referred for psychological evaluation, including 12 controls, who did not receive drugs were administered 6 tests of memory, intelligence, anxiety, and perceptual and motor skills. Epileptics on anticonvulsants showed poor performance on Wechsler Adult Intelligence Scale (WAIS) variables, body image, attention, concentration, and visual motor gestalt function in comparison with the controls, who showed relatively higher anxiety, and poor memory. 5 references. (Author abstract modified)

245986 Watanabe, M.; Kuramoto, S.; Aiba, H. Department of Neurosurgery, Kurume University School of Medicine, Kurume, Japan *L-Dopa therapy and stereotaxic thalamotomy for Parkinsonism*. *Confinia Neurologica -- Borderlands of Neurology* (Basel). 37(1-3):259-264, 1975.

In a paper presented at the sixth symposium of the International Society for Research in Stereotaxic Thalamotomy, Tokyo, October 1973, an investigation of the relative efficacy of L-Dopa therapy and stereotaxic thalamotomy in the treatment of parkinsonism was reported. Results show that L-Dopa therapy alone did not always produce satisfactory results, and at times L-Dopa therapy had to be discontinued because of its side effects. In such cases, thalamotomy was tried. Better results and improvements were obtained with a combination of L-Dopa

therapy and thalamotomy; this combination is recommended in certain considered indications. Results reveal satisfactory maintenance of the therapeutic effect in 64% of the cases. Stereotaxic thalamotomy is given priority over L-Dopa therapy in cases of hemiparkinsonism. 5 references.

246694 Fracchia, J.; Sheppard, C.; Canale, D.; Ruest, E.; Cambria, E.; Merlis, S. Long Island Research Institute, Central Islip, NY 11722 **Combination drug therapy for the psychogeriatric patient: comparison of dosage levels of the same psychotropic drugs, used singly and in combination.** *Journal of the American Geriatrics Society*. 23(11):508-511, 1975.

The dosage levels for a number of frequently prescribed psychotropic drugs, used singly or in combination, were determined in 902 long-term psychogeriatric hospital patients. The data failed to support the hypothesis that physicians prescribe lower dosages when combination therapy is used. Rather the tendency was toward higher dosages under these circumstances. It is concluded that the choice of treatment with combination drugs may be based more upon the availability of numerous potent but only partially effective psychotropic agents purported to have special action than the results of well controlled comparative studies which show that these drugs would be the treatment choice for specific forms of psychiatric illness. 13 references. (Author abstract modified)

246715 Perera, H. V. 57 Ward Place, Colombo 7, Sri Lanka **Two cases of Gilles de la Tourette's syndrome treated with haloperidol.** *British Journal of Psychiatry* (London). 127:324-326, 1975.

Treatment in two cases of Gilles de la Tourette's syndrome occurring in Sri Lanka (Ceylon) are reported. Both patients had the characteristics of the syndrome as described by Fernando (1967): 1) childhood onset (below 16 years of age); 2) multiple motor tics; 3) unprovoked vocal utterances which may progress to coprolalia. Both responded to haloperidol, withdrawal of medication being followed by relapse, and reintroduction by remission. The literature on the etiology of the condition is reviewed. The weight of evidence is considered to favor an organic cause, although psychological precipitation cannot be ruled out. 15 references. (Author abstract modified)

246891 Agurell, Stig; Berlin, Anita; Ferngren, Harry; Hellstrom, Bo. Central Military Pharmacy and Department of Pediatrics, Karolinska Sjukhuset, Stockholm, Sweden **Plasma levels of diazepam after parenteral and rectal administration in children.** *Epilepsia* (Amsterdam). 16(2):277-283, 1975.

Plasma levels of diazepam and N-desmethyldiazepam were investigated in 19 children by a gas chromatographic method permitting the use of capillary samples. Intravenous administration was studied in three children and the plasma level curves showed a rapid decline during the first hour. Absorption and elimination after rectal administration of a solution in 16 children were similar to those after intramuscular administration. Diazepam given by suppository to five children gave much lower plasma levels and delayed time to peak levels. Recurrence of seizures in two children indicated that the anticonvulsant plasma level was of the order of 150 to 200 microg/liter. No significant side-effects were observed. It is concluded that rectal administration of a solution of diazepam is a practical method to arrest convulsions in children. 16 references. (Author abstract)

246995 Caccia, M. R. Servizio di Neurofisiopatologia, Ospedale Regionale, Bergamo, Italy **Clonazepam in facial neuralgia and cluster headache: clinical and electrophysiological study.** *European Neurology* (Basel). 13(6):560-563, 1975.

The efficacy of Clonazepam in the treatment of facial neuralgia and cluster headache is examined. Ten patients affected by paroxysmal facial neuralgia were given Clonazepam daily at an initial dose of 8mg, gradually falling to 4mg over a period of 10 days and then maintained at this level for 1 month. It was found that Clonazepam completely suppressed pain after 7 to 15 days of treatment in five cases of trigeminal neuralgia. Clonazepam administration did not, however, significantly alter the early glabellar and late glabellar responses in any of the cases. It is concluded that in cases of typical trigeminal neuralgia Clonazepam is as effective as other anticonvulsants with the advantage of having no side-effects on leukocytes and liver function. 5 references.

247022 no author. no address **Cyclandelate checks mental decay: aged patients' IQ and memory preserved with use of vasodilator.** *Medical World News*. 16(24):52, 1975.

The use of the vasodilator cyclandelate to halt mental deterioration in aged patients is reported. The drug is judged successful in preserving IQ, memory, and verbal ability among patients with cerebral arteriosclerosis during six month test periods. No significant differences in patient behavior when on and off the drug were observed. However, psychological tests showed some improvement in all the factors measured, including mental state, mood, orientation, and aphasia, and statistically significant improvement in memory, constructional apraxia, and the ability to abstract. No measurable decline in patient IQ during cyclandelate therapy was observed; however, decline was found to be statistically significant when a placebo was substituted. The major differences were observed in comprehension and verbal ability, which are described as highly significant statistically. It is concluded that cyclandelate acts prophylactically to arrest the deterioration of mental performance, rather than to reverse any earlier decline.

247030 Brodie, N. H.; McGhie, R. L.; O'Hara, H.; Valle-Jones, J. C.; Schiff, A. A. Brighton, Sussex, England **Anxiety/depression in elderly patients: a double-blind comparative study of fluphenazine/nortriptyline and promazine.** *Practitioner* (London). 215(1289):660-664, 1975.

The use of fluphenazine/nortriptyline and promazine in the treatment of mixed states of anxiety and depression is studied in a population of 64 elderly patients, 62 of whom completed 28 days of clinical trials. Patients suffering from anxiety/depression, aged 65 years and over, were randomly assigned for treatment with either drug. Clinical status was assessed on days 0, 7, and 28, using a physician's clinical rating scale, a patient's visual analogue scale, and a side-effects inventory. Direct questioning as to side-effects was avoided. Fluphenazine/nortriptyline was found to be significantly better than promazine in the early relief of the cluster of symptoms representing anxiety; this trend continued through day 28, but no longer at a significant level. Promazine also produced a higher level of side-effects. It is concluded that treatment with a combined antidepressant and anxiolytic should be the initial therapy in otherwise healthy elderly patients manifesting loss of initiative, irritability, hypochondriasis, agitation and insomnia, which could arise from an underlying depressive disease. 14 references.

247375 Connors, C. Keith. University of Pittsburgh School of Medicine, Pittsburgh, PA 15261 **Controlled trial of methylphenidate in preschool children with minimal brain dysfunction.** *International Journal of Mental Health*. 4(1-2):61-74, 1975.

Results of a controlled trial study of methylphenidate treatment of preschool children with minimal brain dysfunction (MBD) are presented in an attempt to identify the requirements of proper short-term care on a clinical basis and to obtain physical, behavioral, cognitive, and background data on such children. Results show that: 1) methylphenidate produces significant clinical improvement in preschool MBD children; 2) the clinical improvement is apparent with a relatively small average dose (about 1.5mg/kg body weight); 3) objective measures of intelligence and visual/motor integration show enhancement in Ss undergoing the treatment, while measures of vigilance, seat activity, and impulsivity did not show significant improvement; 4) significant reductions in restless and disturbing behavior were noted by parents; 5) the drug enhances the cortical evoked responses in the left parietal area, consistent with previous findings with older Ss; and 6) side-effects were generally minimal. Although significant drug effects were noted, it is noted that the results are more variable and unpredictable than in similar treatment with older MBD children. 2 references.

247743 Werry, John S.; Dowrick, Peter W.; Lampen, Eileen L.; Vamos, Marina J. Department of Psychiatry, School of Medicine, University of Auckland, Auckland, New Zealand **Imipramine in enuresis -- psychological and physiological effects.** *Journal of Child Psychology and Psychiatry etc.* (Oxford). 16(4):289-299, 1975.

The psychological and physiological effects of imipramine on enuretic boys not previously treated with antidepressant drugs were studied. Imipramine was given to 24 mostly psychiatrically normal boys, ages 5 to 11, in a single nocturnal dose of 50mg over a 3 week period in a double-blind, placebo controlled and crossover trial to determine what effects the drug was having on systems other than the urinary tract. Behavioral changes, mostly of a positive kind, slight weight loss, tachycardia, raised diastolic blood pressure, and cognitive changes occurred, suggesting that the effect of the drugs in children is analogous to that of the stimulants, at least over a 3 week period. It is suggested that the effect of antidepressants in normal subjects is no different from that in depressed patients. It is recommended that the findings of this study be replicated. 31 references. (Author abstract modified)

247878 Gross, Mortimer D. 1893 Sheridan Road, Highland Park, IL 60035 **A comparison of dextro-amphetamine and racemic-amphetamine in the treatment of the hyperkinetic syndrome or minimal brain dysfunction.** *Diseases of the Nervous System*. 37(1):14-16, 1976.

In a double-blind trial of placebo, dextroamphetamine, racemic amphetamine and methylphenidate, each used for a week, in 48 children with the diagnosis of minimal brain dysfunction or hyperkinetic syndrome, it was found that although on the average dextroamphetamine as well as methylphenidate was significantly superior to racemic amphetamine, with similar side-effects, in some cases racemic amphetamine was superior to both dextroamphetamine and methylphenidate. In 20 cases, improvement was approximately equal for both the dextro and racemic forms; of these 20, side-effects were absent for both in 10 patients; dextroamphetamine showed fewer side-effects in three patients, and racemic amphetamine showed fewer side-effects in seven patients. In 20 other patients, dextroamphetamine resulted in greater clinical improvement than racemic amphetamine, while in seven cases the reverse was true. It is suggested that when satisfactory results are not obtained with the usual pharmacological agents, racemic amphetamine might

be an effective alternative. 12 references. (Author abstract modified)

247967 Viukari, M.; Linnoila, M. Dept. of Pharmacology, University of Helsinki, Helsinki, Finland **Effect of methylodopa on tardive dyskinesia in psychogeriatric patients.** *Current Therapeutic Research*. 18(3):417-424, 1975.

The effect of methylodopa on tardive dyskinesia was studied in 15 chronic psychogeriatric patients. The patients' neuroleptic medication was kept stable during the 4 week double-blind placebo controlled experiment. Methylodopa proved more effective than placebo in relieving tremor, rigidity, and orofacial dyskinesia. Akinesia and akathisia were not significantly relieved. 21 references. (Journal abstract)

248172 McArthur, A. W.; Pollock, M.; Smidt, Ngaire A. Department of Nuclear Medicine, Dunedin Hospital, Dunedin, New Zealand **Combined therapy with tetrabenazine and pimozide in Huntington's chorea: pilot study.** *New Zealand Medical Journal* (Dunedin, New Zealand). 83(558):114-116, 1976.

A study to assess the effectiveness of prolonged treatment with tetrabenazine and pimozide for three long-term Huntington's chorea patients is reported. Results show that combined use of these drugs rapidly controlled dyskinesia in all for 3 to 4 weeks with gradual regression in successive therapeutic phases. Reduction in abnormal movement counts and improvement in behavior occurred in only one patient. It is concluded that the choreiform movements of Huntington's chorea can be treated at least temporarily with tetrabenazine and pimozide, although the advancing neuronal deficit cannot be significantly modified by drug treatment. It is suggested that additional temporary benefits might accrue from exploration of the functions of other putative neurotransmitters, in addition to dopamine. 14 references.

248533 Lomen, P.; Linet, O. I. Wayne State University School of Medicine, Detroit, MI **Hypnotic efficacy of triazolam and methypylol in insomniac in-patients.** *Journal of International Medical Research* (Northampton). 4(1):55-58, 1976.

The hypnotic effect of a new triazolobenzodiazepine, triazolam (Halcion) 0.5mg and methypylol 300mg is compared in twenty oncologic inpatient volunteers with insomnia using the preference technique. On the first night of the two-night trial, triazolam or methypylol was given on a double-blind basis and on the second night the patients received the alternate medication. Following each trial night the patients were interviewed in regard to their sleep. Of the seventeen patients who completed the study, eleven patients preferred triazolam, three preferred methypylol and three had no preference ($p = 0.057$). Analysis of the various sleep parameters showed that triazolam helped the patients sleep more than methypylol ($p = 0.013$), induced more rapid sleep onset ($p = 0.003$), gave a longer duration of sleep ($p = 0.013$). The treatment was considered a success if the patient went to sleep in thirty minutes or less and slept for at least six hours. Triazolam was more successful than methypylol in this respect ($p = 0.012$). There were no side-effects reported on either of the drugs. 15 references. (Author abstract)

248593 Werry, John S.; Sprague, Robert L.; Cohen, Miye N. Department of Psychiatry, University of Auckland, School of Medicine, P.B., Auckland, New Zealand **Conners' teacher rating scale for use in drug studies with children -- an empirical study.** *Journal of Abnormal Child Psychology*. 3(3):217-229, 1975.

A replication is made of Conners' Teacher Rating Scale. Classroom teachers rated 291 schoolchildren, grades kindergarten through 6, on Conners' Teacher Rating Scale, developed for and used widely in drug studies in children. Scores were found to be significantly lower than those reported for a similar group of 92 New York children and considerably less than those of a group of 64 children receiving medication for deviant behavior. Boys generally had higher scores for acting-out type behavior while girls scored higher on neuroticism. The factor structure in this sample showed some differences from that in Conners' original analysis but they are insufficient for any change in the widely accepted scoring system, except perhaps to add a fifth factor of sociability. 17 references. (Author abstract modified)

248612 Lieberman, Abraham; Goodgold, Albert; Jonas, Saran; Leibowitz, Morton. Department of Neurology, New York University School of Medicine, New York, NY **Comparison of dopa decarboxylase inhibitor (carbidopa) combined with levodopa and levodopa alone in Parkinson's disease.** *Neurology*. 25(10):911-916, 1975.

A double-blind study comparing the effects of carbidopa and levodopa combined in a single tablet with levodopa alone was undertaken in 50 patients with Parkinson's disease. After 6 months, there was a statistically significant improvement over baseline in total score, rigidity, and tremor only in the patients randomized to carbidopa/levodopa. In addition, 40 of the patients treated with carbidopa/levodopa showed obvious clinical improvement (a greater than 50% reduction in their total score) over treatment with levodopa alone. However, after 2 years, only 20% continued to show this improvement. Nausea, vomiting, and anorexia developed in 56% of patients on levodopa but in only 27% of patients on carbidopa/levodopa. However, abnormal involuntary movements, observed in 48% of patients on levodopa, were present in 77% of patients on carbidopa/levodopa. Despite the increase in abnormal involuntary movements, carbidopa/levodopa is more effective than levodopa. 48 references. (Author abstract)

248613 Leibowitz, Morton; Lieberman, Abraham. Department of Neurology, New York University Medical Center, New York, NY **Comparison of dopa decarboxylase inhibitor (carbidopa) combined with levodopa and levodopa alone on the cardiovascular system of patients with Parkinson's disease.** *Neurology*. 25(10):917-921, 1975.

The effects of carbidopa combined with levodopa (carbidopa/levodopa) and levodopa alone on the cardiovascular system of patients with Parkinson's disease were evaluated. Thirty eight patients who had been on stable doses of levodopa underwent a complete cardiac examination, including measurement of recumbent and erect blood pressure and 24 hour ambulatory electrocardiographic monitoring. Patients were classified with respect to the presence or absence of clinically significant heart disease and ventricular arrhythmias. Nineteen of the 38 patients (50%) had heart disease, and 12 (32%) had significant ventricular arrhythmias. Eleven of the 12 with arrhythmias had underlying heart disease. The incidence of arrhythmias did not correlate with the dose of levodopa. The patients were subsequently randomly assigned to treatment groups receiving either carbidopa/levodopa or levodopa alone. There was no significant difference in the severity of ventricular arrhythmias or in the incidence of orthostatic hypotension in the group assigned to carbidopa/levodopa compared with the group receiving levodopa. 18 references. (Author abstract)

249144 Masanes, Ph.; Touchard, F. M.; Kohler, M.; Barret, T. Service de Pedopsychiatrie, Hopital psychiatrique de Naugeat, F 87031 Limoges, France **Assessment of diazepam after three years use in child psychiatry.** / Bilan de 3 ans d'utilisation du diazepam en pedopsychiatrie ambulatoire. *Revue de Neuropsychiatrie Infantile etc.* (Paris). 23(7):465-469, 1975.

Results are reported of a 3 year study of 63 children, aged 4 to 15.5 years who were treated with diazepam (Valium) on an outpatient basis at a hospital child psychiatry service. The patients were referred to the clinic by parents, school authorities or social workers; the length of treatment varied from 2 weeks to 1 year. No cases of intolerance to the drug are reported. Diazepam was observed to be particularly effective in controlling anxiety, hypermotivity, sleep disorders and enuresis; results were less consistent in prepsychotic children and in those with behavioral and personality disorders. Valium is concluded to be an excellent tranquilizer with remarkable tolerance and an unusual variety of forms, which deserves consideration in all types of childhood psychological disturbances.

249351 no author. no address **For senile dementia: chemical correction?** *Medical World News*. 17(4):43, 1976.

Studies to determine whether drugs can correct biochemical deficiencies in neurotransmission processes in elderly patients with senile dementia are reported. The first test described was conducted on normal young adults to ascertain which drugs specifically operate on the cholinergic system in which memory occurs. Subjects were given scopolamine to stimulate memory loss, measured by psychological tests, then administered an anticholinesterase agent, physostigmine, which reversed the scopolamine effect. In a second test, nine elderly patients with senile dementia were administered small doses of L-Dopa, a catecholamine neurotransmitter. Pronounced intellectual and motor improvement was noted in three of the patients, moderate improvement in two, and equivocal results in four. It is concluded that a specific pharmacosystem approach can change cognitive aspects of mental function.

249625 Rada, Richard T.; Kellner, Robert. Department of Psychiatry, University of New Mexico School of Medicine, 930 Stanford Drive NE, Albuquerque, NM 87131 **Thiothixene in the treatment of geriatric patients with chronic organic brain syndrome.** *Journal of the American Geriatrics Society*. 24(3):105-107, 1976.

Thiothixene was used in a four-week double-blind placebo-controlled study 42 geriatric patients with chronic organic brain syndrome (psychotic or nonpsychotic). The results, according to several rating measures, show no significant difference between placebo and thiothixene. Side effects were mild and few. These data support the safety of thiothixene therapy for geriatric patients. However, there is no conclusive evidence of its efficacy in the treatment of chronic organic brain syndrome. 12 references. (Author abstract modified)

249693 Tabet, Ph. Service de Medecine Interne, Hopital Intercommunal, 83600 Frejus-Saint-Raphael, France **Dogmatil and behavioral problems in migrant workers.** / Dogmatil et troubles du comportement des travailleurs immigrés. *Semaine des Hopitaux* (Paris). 51(7-8):429-430, 1975.

The effect of Dogmatil on the behavioral problems of migrant workers was studied. Of the 300 migrant workers in the subject population, 7% of the cases were diagnosed as acute polymorphic reactional psychoses; 10% were reactional depressions; 50% were depressive states of a hypochondriacal

nature; 25% were sinistroses, and 4% were cases of anorexia nervosa. Dogmatil was prescribed in 64 adult cases, most of whom were male. Three stages of treatment are described: an initial aggressive 10 day treatment period in which Dogmatil was administered intramuscularly; a second 10-day period of oral dosage; and a final consolidation period with reduced dosage, lasting 2 or 3 weeks according to the progress of the individual patient. In 60% of cases, Dogmatil was prescribed alone; in 20% of cases, it was prescribed with a classic anti-ulcer treatment; in 10% of the cases, it was prescribed with antibiotics; and in 10% of the cases it was given with antidepressants. Results indicate that Dogmatil is effective in correcting mood and behavior problems linked to adaptation difficulties of migrants, especially in depressive and hypochondriacal conditions.

249772 Knobel, Mauricio. School of Medicine, University of Buenos Aires, Argentina *Approach to a combined pharmacologic therapy of childhood hyperkinesia*. Behavioral Neuropsychiatry. 6(1-12):87-90, 1975.

The pharmacologic management of childhood hyperkinesia with psychostimulants is illustrated in a clinical trial carried out in 30 children aged from 5 to 10 years, with 2-dimethylaminoethanol in association with a magnesium salt of dipropylacetic acid (DAP). In the case of hyperkinesia with an organic background with evident electroencephalographic signs, the association with different anticonvulsants is usually beneficial although at times it gives rise to exceptionally undesirable side-effects, or to a paradoxically depressant action of the psychic activity. An evident improvement was obtained in 97.6% of the cases treated. There was no evidence of drowsiness or other side-effects. On the contrary, it may be affirmed that potentiation took place of the already known effect of 2-dimethylaminoethanol. With the exception of five patients no favorable changes were demonstrated in the electroencephalographic tracings. It is concluded that the results of this drug association are superior to those so far reputed in the treatment of childhood hyperkinesia. 27 references. (Author abstract modified)

250414 Hussain, S. M. A.; Gedy, J. L.; Naylor, R.; Brown, A. L. Lennard Hospital, Bromley, Kent, England *The objective measurement of mental performance in cerebrovascular disease: a double-blind controlled study, using a graded-release preparation of isoxsuprine*. Practitioner (London). 216(1292):222-228, 1976.

An automatically controlled learning task was used to assess objectively the performance of a number of geriatric patients with cerebrovascular disease. The effect on the performance of the patients during treatment with isoxsuprine hydrochloride in a sustained release presentation (Duvadilan Retard) was measured during a double-blind placebo controlled trial of 16 weeks' duration. There was a significant difference in the improvement in performance between the treated and untreated groups; by the end of the trial, the treated group having statistically better scores. It is concluded that the Questec method is an objective measurement of mental performance and is a useful tool for the geriatrician in the assessment of patients and those in research into brain dysfunction of varying types. 12 references. (Author abstract modified)

250726 Raskin, Allen; Crook, Thomas H. Psychopharmacology Research Branch, National Institute of Mental Health, 5600 Fishers Lane, Room 9-101, Rockville, MD 20852 *The endogenous-neurotic distinction as a predictor of response to antidepressant drugs*. Psychological Medicine (London). 6(1):59-70, 1976.

The meaning and validity of the endogenous/neurotic distinction in depression is empirically investigated, and the practical value of this distinction as a predictor of antidepressant drug response is evaluated. An inverse factor analysis of 880 depressed inpatients on 33 endogenous/neurotic variables yielded four patient types. Type 3 resembled the endogenous depressions and Type 2 the neurotic depressions. Type 3 patients responded well to both imipramine and chlorpromazine and did poorly on a placebo. Type 2 patients showed the greatest overall improvement at three weeks irrespective of treatment received, including a placebo. It is concluded that while imipramine with its mild energizing and euphoriant properties would prove especially useful for the psychotic depressions, both imipramine and chlorpromazine should prove beneficial for the endogenous depressions. 41 references. (Author abstract modified)

250779 Zilm, Duane H.; Sellers, Edward M.; MacLeod, Stuart M.; Degani, Naama. Clinical Institute, Alcohol and Drug Addiction Research Foundation, 33 Russell Street, Toronto, Ontario, M5S 2S1, Canada *Propranolol effect on tremor in alcoholic withdrawal*. Annals of Internal Medicine. 83(2):234-236, 1975.

Four chronic alcoholics who were in withdrawal and who had exaggerated postural tremor associated with the syndrome were given small intravenous injections of dl-propranolol (0.1 to 1.0 mg). Hand tremor was dramatically reduced by 60% to 95% after the injection, though changes in tremor frequency were much less apparent. The reduction was accompanied by a 5% to 20% decrease in heart rate. Plasma propranolol concentration did not exceed 18 micrograms/litre. It is concluded that propranolol decreases alcoholic withdrawal tremor by peripheral beta receptor blockade because of the known site of action of the drug in other hyperadrenergic states, and the small doses required to produce the effect. 5 references.

250927 Sweet, Richard D.; McDowell, Fletcher H. Department of Neurology, Cornell University Medical College, New York Hospital, 525 East 68 Street, New York, NY 10021 *Five years' treatment of Parkinson's disease with levodopa: therapeutic results and survival of 100 patients*. Annals of Internal Medicine. 83(4):456-463, 1975.

The therapeutic results, survival rate, and complications of 100 Parkinson patients who received levodopa treatment for 5 years are presented. Forty seven patients are still being followed on levodopa, and half of them are at least 25% better than at their pretreatment evaluation. However, the average functional rating is returning toward baseline from its remarkable improvement at .5 to 2 years. Abnormal involuntary movements, rapid oscillations in motor performance, postural instability, and dementia have become the major adverse effects. Thirty two of the 100 patients have died. Life table analysis shows an excess mortality of 1.9 compared with the U.S. population, a figure that is lower than the 2.9 reported before levodopa's use. Despite its inability to cure Parkinson's disease, levodopa provides symptomatic relief for a prolonged time and it remains the single most effective medication for the illness. 48 references. (Author abstract modified)

250942 Chase, Thomas N.; Shoulson, Ira. Neurology Unit, National Institute of Mental Health, 9000 Rockville Pike, Bethesda, MD 20014 *Behavioural and biochemical effects of fenfluramine in patients with neurologic disease*. Postgraduate Medical Journal (Oxford). 51(1):105-109, 1975.

At a symposium organized by the Servier Research Institute held in Marbella, Spain March 1974, the effects of fenflur-

ramine on eight nonobese adults with Huntington's disease, tardive dyskinesia and spinocerebellar degeneration. Fenfluramine was administered in a double-blind therapeutic trial for eight days; maximum oral dose levels (120mg/day) were maintained for five days. Identically appearing placebo capsules were administered for 9 to 14 days either immediately before or just after active drug treatment. Subjects' assessment of appetite showed no definite change with fenfluramine. Results indicate that caloric intake and body weight, nevertheless, declined significantly. Daily nurses' ratings of eight behavioral parameters remained unchanged except for increased somnolence and depression. It was found that fenfluramine treatment had no effect on involuntary movements in patients with Huntington's disease. It was found that the central turnover of serotonin, as estimated by the oral probenecid loading technique, decreased in all five patients tested. Further, no consistent effect on dopamine metabolism was observed. 43 references.

250944 Davidson, D. L.; Campbell, Catherine; Mawdsley, C.; Munro, J. F. Neurological Unit and University Department of Medical Neurology, Northern General Hospital, Edinburgh EH5 2DQ, Scotland **Fenfluramine withdrawal and epilepsy.** *Postgraduate Medical Journal* (Oxford). 51(1):174-176, 1975.

In a paper presented at a symposium organized by the Servier Research Institute held in Marbella, Spain March 1974, a preliminary study of the effects of administration of fenfluramine and its withdrawal in obese, nonepileptic subjects was reported. A case is reported in which bizarre behavior and impaired mental functioning occurred 24 hours after the abrupt withdrawal of fenfluramine. The patient had a history of a convulsion five months previously and of occasional momentary episodes in which she was unable to recall what she was doing. EEG's of nonepileptic subjects made before, during and after administration of fenfluramine showed no severe generalized disturbances. Pending further evidence, it is suggested that fenfluramine should not be used in obese epileptic patients, and that it should always be withdrawn gradually. 11 references.

251103 Heckmatt, J. Z.; Houston, A. B.; Clow, D. J.; Stephenson, J. B. P.; Dodd, K. L.; Lealman, G. T.; Logan, R. W. Royal Hospital for Sick Children, Yorkhill, Glasgow, Scotland G3 8SJ **Failure of phenobarbitone to prevent febrile convulsions.** *British Medical Journal* (London). 6009(1):559-561, 1976.

The use of phenobarbitone to prevent febrile convulsions in infants is evaluated in an attempt to enlarge upon a previous study which had suggested the drug's effectiveness. It is noted that febrile convulsions if prolonged and severe have been associated with irreversible cerebral injury leading to mental handicap, cerebral palsy, or secondary epilepsy. One hundred and sixty five children without known neurological disorder who presented with their first febrile convulsion between the ages of six months and three years were assigned to daily phenobarbitone treatment or to a control group and followed up at a special clinic for six months. One hundred and sixty one children completed the trial, and of the 88 children assigned to phenobarbitone treatment 10 had further convulsions during this period compared with 14 of the 73 control children. Only 49 of those assigned to phenobarbitone took the drug regularly throughout the trial, and four of these had further febrile convulsions, a proportion not significantly different from that in the controls. All four had mean plasma phenobarbitone concentrations over 69 micromoles/liter (16 micrograms/milliliter during the trial and in three the plasma concen-

tration was at or over this figure within eight hours of the repeat convulsion. It is concluded that regular phenobarbitone does not seem to prevent febrile convulsions. It is thought that attention should instead be directed to organizing emergency services to allow early termination of febrile convulsions, whether first or subsequent, to prevent irreversible brain damage. 21 references. (Author abstract)

251163 Thompson, M. K. Woodside Health Centre, London, England **Oxprenolol in senile tremor.** *Scottish Medical Journal* (Glasgow). 20(6):291-292, 1975.

The effectiveness of the beta adrenergic blocker, oxprenolol, in treating senile (Parkinsonian) tremor is briefly described. Research with 12 patients, average age 75 years, indicated that of the nine patients completing the treatment, two showed marked preference for oxprenolol over a placebo and a definite improvement in performance. It is concluded that, in addition to the ischemic heart disease value of the drug, a dose of 40mg per day is well tolerated in the elderly patient; and it may reduce tremor and enable some patients to accomplish previously impossible hand movements (such as handwriting). 2 references.

251239 Parkes, J. D.; Marsden, C. D.; Donaldson, I.; Galea-Debono, A.; Walters, J.; Kennedy, G.; Asselman, P. University Department of Neurology, Institute of Psychiatry, London, England. **Bromocriptine treatment in Parkinson's disease.** *Journal of Neurology, Neurosurgery and Psychiatry* (London). 39(2):184-193, 1976.

To assess the effectiveness of a new drug treatment regimen for the management of Parkinsonism, 31 patients with Parkinson's disease were treated with the ergot alkaloid bromocriptine, a drug which stimulates dopamine receptors. Bromocriptine had a slight therapeutic effect in patients on no other treatment and an additional effect in patients on levodopa. The mean optimum dosage of bromocriptine, established over a 12 week period, was 26mg daily. In 20 patients bromocriptine was compared with placebo in a double-blind controlled trial. Active treatment caused a significant (P less than 0.02) reduction in total disability and akinesia scores. The least disabled patients showed the greatest response. Side-effects of bromocriptine -- nausea, vomiting, hallucinations, and abnormal involuntary movements -- were similar in nature to those of levodopa. In most normal subjects, bromocriptine causes an increase in plasma growth hormone concentration. This was determined in 20 patients with Parkinson's disease after 1 to 15mg bromocriptine. Only one patient showed an obvious increase up to 120 minutes after a dosage. Bromocriptine was not an effective treatment in two patients who had not previously responded to levodopa, and replacement of this drug by bromocriptine in patients with end of dose akinesia after chronic levodopa treatment did not totally abolish response swings. 14 references. (Author abstract modified)

251418 Planz, G.; Gierlichs, H. W.; Hawlina, A.; Planz, R.; Stephany, W.; Rahn, K. H. Abteilung Innere Medizin II der RWTH, D-51 Aachen, Germany **The influence of the decarboxylase inhibitor benserazide on antihypertensive effect and metabolism of methyldopa in hypertensive patients.** *Naunyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 293(Suppl.):R63, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft held in Mainz, Germany, March 23 through 26, 1976 a study on the influence of benserazide on the antihypertensive effects and metabolism of methyldopa in hypertensive patients is reported. It is noted

that dopa-decarboxylase inhibitors such as benserazide (B) are now frequently used in the treatment of parkinsonism. It was investigated whether B influences the antihypertensive effect of alpha-methyl dopa (MD) in patients with essential hypertension. This study would also give insight into the mechanism of action of MD in man. In each of 3 patients receiving MD (mean 1.8g/day), 375 and 750 mg/day B was added. MD lowered blood pressure (BP) from 165/107 to 136/93 mm Hg. B did not alter the hypotensive effect of MD, although the decarboxylation of MD was markedly reduced as shown by the urinary excretion of alpha-methyl dopamine (MDA). During application of MD the ratio MD/MDA in urine was 13/1. When 375 mg/day B was added, this ratio rose to 33/1. It was 32/1 at the higher dose of B. Thereafter, in a double blind crossover study the BP effects of 3 weeks treatment with MD (mean 1.75 g/day), B (375/day), placebo and their combinations were compared in 5 hypertensives. Again, MD lowered BP. B did not influence the effect of MD. To study whether B enters the CNS, an oral dose of 125 mg 14C-B was given to 2 patients 2 hours prior to diagnostic lumbar puncture. Total radioactivity in spinal fluid was less than 1% of the plasma. It is concluded that inhibition of peripheral dopa-decarboxylase does not influence the antihypertensive effect of MD. The results suggest that MD lowers BP by a central mechanism. (Author abstract modified)

251572 David, Oliver. Child Behavior Research Unit, State University of New York, Downstate Medical Center, 450 Clarkson Avenue, Brooklyn, NY 11203 The food additive hypohesia, lead, and hyperactivity. *Pediatrics*. 57(4):576, 1976.

Results of treating hyperactive children with lead chelating agents are reported. It is noted that although a worsening of the behavioral disturbance is experienced at the beginning of the regimen, at the end of an adequate therapeutic regimen with a consistent and significant lead diuresis, a marked improvement occurs. It is pointed out that CaEDTA, a powerful chelating agent, is used ubiquitously as a food additive. The similarities between these observations and those of Dr. Feingold concerning hyperactivity and its association with food additives are noted. 1 reference.

251648 Barbeau, Andre; Roy, Madeleine. Clinical Research Institute of Montreal, 110 Pine Avenue West, Montreal, Quebec, Canada Six-year results of treatment with levodopa plus benserazide in Parkinson's disease. *Neurology*. 26(5):399-404, 1976.

A combination of levodopa and a peripheral dopa decarboxylase inhibitor, benserazide (Ro 4-4602), was studied over a 75 month period of observation in 132 patients with Parkinson's disease. The combined therapeutic approach was without biological toxicity, was well tolerated by 95% of patients, and was highly effective: 72% of patients improved by more than 50% on a functional activity scale and the group as a whole improved on an objective battery by a mean of 46%. Neurologic side effects of abnormal involuntary movements, falls, and oscillations in performance were not improved over levodopa used alone. It is recommended that the combined therapy be preferred over the use of levodopa alone in the symptomatic management of Parkinson's disease. 19 references. (Author abstract)

251717 Lauer, John W. 251 East Chicago Avenue, Suite 1427, Chicago, IL 60611 The effect of tricyclic antidepressant compounds on patients with passive-dependent personality traits. *Current Therapeutic Research*. 19(5):495-505, 1976.

The effect of tricyclic antidepressant compounds on patients with passive/dependent personality traits is reported. In a study of 74 patients with passive/dependent personality traits and a variety of psychotic and neurotic diagnoses, 37 patients treated with 200 to 300 milligrams daily of a tricyclic antidepressant compound, imipramine or nortriptyline, became significantly less anxious and more energetic and outgoing as measured by the Minnesota Multiphasic Personality Inventory, the Edwards Personal Preference Scale, and a specially devised questionnaire. A matched sample of 37 patients treated without these medications did not change significantly according to the same criteria. 26 references. (Author abstract modified)

251718 Mielke, D. H.; Gallant, D. M.; McFarlain, R. A. Department of Psychiatry, Tulane University School of Medicine, New Orleans, LA 70118 Clorazepate dipotassium (Tranxene): a controlled evaluation in alcoholic patients after withdrawal. *Current Therapeutic Research*. 19(5):506-511, 1976.

A double-blind 4 week evaluation of clorazepate dipotassium (Tranxene) and a placebo was carried out in 91 nonpsychotic, volunteer patients recently withdrawn from alcohol. Change scores varied with the psychometric measurement analyzed (nonparametric). A special analysis of data from matched subjects was also performed. All three groups showed significant decreases in anxiety during this study, although the most anxious subjects showed the most improvement. The positive relationship between initial anxiety and improvement was strongest for the two active medication groups on all three measures examined. The significant drug group differences obtained suggest a weak drug effect. Overall, there is the suggestion that those subjects who are among the most severely anxious will profit the most from both anxiolytic agents. 3 references. (Author abstract)

251949 Schain, Richard J.; Ward, Joseph W. no address Effect of carbamazepine (Tegretol) on attentional and perceptual functions of children with epilepsy. *Neurology*. 26(4):362-363, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, forty five children with major motor or psychomotor seizure disorders were treated with carbamazepine in place of sedative anticonvulsants (phenobarbital, primidone) because of chronic behavioral difficulties. A battery of measures believed to reflect attentional and perceptual abilities was administered initially and repeated 4 to 6 months later following the drug crossover. At the conclusion of the study, 37 of the 45 children were judged to be drug success; that is, general alertness and attentiveness were improved while seizures were adequately controlled. The drug success subjects were divided into two subgroups: 1) major reduction of seizure frequency and severity (20); 2) little or no change in seizures (17). Analysis of psychometric data showed statistically significant improvement in performance (15 to 40%, p less than 0.01) in all cognitive tasks with both subgroup of the drug success group, although a greater improvement occurred in group 1. Only a small change (4.5%) occurred in performance on the Wechsler Intelligence Scale, indicating that the attentional/perceptual measures were more sensitive indexes of the improvement in mental functions. This study indicates that therapeutic regimens of carbamazepine (dosage, 10 to 30mg/kg/day; serum levels, 3 to 13micromg/ml) are less likely to interfere with mental functions in children than are equivalent dosages of sedative anticonvulsants. Serious consideration should be given to the use of this agent as a first line anticonvulsant in children with major motor or psychomotor epilepsy. (Author abstract modified)

251952 Huttenlocher, Peter R. no address **Isoprinostine therapy in subacute sclerosing panencephalitis.** *Neurology*. 26(4):364, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, results were reported on Isoprinostine therapy in three children with subacute sclerosing panencephalitis (SSPE). The children had either dementia, periodic myoclonus, burst suppression pattern on EEG, elevated CSF IgG, and high rubella titers in serum and CSF. Improvement was observed in two. A 14-year-old girl had severe myoclonus, left hemiparesis, and a verbal IQ (WISC) of 56, performance IQ below testable range at the start of Isoprinostine, 3.5gm/day. Six months later, her gait had improved and myoclonic seizures had lessened, but intellect was unchanged. After 12 months on Isoprinostine the myoclonus and the hemiparesis had cleared, and verbal IQ had increased to 70, performance IQ to 48. Improvement in motor function and in myoclonus without any significant change in mental state occurred in an 11-year-old boy during 10 months of therapy. In both patients, clinical response was accompanied by improvement in the EEG and by decline in CSF IgG and in CSF and serum rubella titers. A 12-year-old boy showed further neurologic deterioration after 7 months on Isoprinostine. This child differed from the other two in that he had a more rapidly progressive course and had absence of delayed hypersensitivity reactions to several intradermally injected antigens. These results, together with those of Mattson are felt to provide indication for a larger scale clinical trial of Isoprinostine in SSPE. (Author abstract modified)

251961 Togli, Joseph U.; McGlamery, Muriel; Sambandham, Ragu. no address **Tetrabenazine in the treatment of hyperkinetic movement disorders.** *Neurology*. 4(26):374, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, fifteen patients with involuntary hyperkinetic disorders were treated with tetrabenazine in doses up to 200mg daily for periods ranging from 2 weeks to 12 months. Seven of these patients have Huntington's chorea, and the others had choreoathetosis, spasmodic torticollis, dystonia musculorum deformans, or olivopontocerebellar atrophy. Only the patients with Huntington's chorea responded to this therapy. One of them showed total suppression of the involuntary movements, four showed moderate improvement, and two had no response. No significant side-effects were observed; therapy was stopped in one patient only, because of severe drowsiness and akathisia. This investigation suggests that tetrabenazine may be useful in suppressing involuntary movements in some patients with Huntington's chorea. This conclusion is supported by a few similar reports in the literature. (Author abstract modified)

251962 Golden, Gerald S. no address **Tourette's syndrome and central nervous system stimulants.** *Neurology*. 4(26):374, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, a survey of 72 patients with Tourette's syndrome revealed that 29 had been prescribed central nervous system stimulants, six before the onset of symptoms and 23 after. In the latter group, nine patients had no change in symptoms, while 14 became dramatically worse. Two of three patients taking stimulants without difficulty before the onset of their symptoms had marked worsening when the same drug was used after the syndrome was diagnosed. Neither clinical features nor the stimulant used predicted the response. Three patients had the initial onset of Tourette's syndrome immediately following the institution of methylphenidate for treatment of hyperkinesia. In each case,

the syndrome appeared rapidly and consisted of multiple tics, involving especially the face and upper extremities, and the production of involuntary inarticulate sounds. The symptoms persisted unchanged when the medication was discontinued, but were alleviated by administration of haloperidol. The children remained dependent on haloperidol for symptomatic relief. These data were consistent with the hypothesis that abnormalities in biogenic amine metabolism, possibly dopamine, are involved in the pathogenesis of Tourette's syndrome. The possibility of two biochemically distinct patient groups also must be considered. (Author abstract modified)

251966 Jammes, Juan L.; Osheroff, Raphael. no address **Treatment of "dialysis dementia" with thiamine.** *Neurology*. 4(26):391, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, a report was given of a therapeutic response of dialysis dementia with thiamine. A 60-year-old male undergoing hemodialysis for renal insufficiency was presented with progressive apathy, lethargy, and unsteadiness for 2 weeks. Examination revealed an ataxic gait: poverty of expression; memory deficits; concrete thinking; ability to subtract simple numbers; and impaired judgment (Halstead psychologic test); partial optic atrophies; positive snout, palmarmental, and glabella reflexes; and signs of peripheral neuropathy. Electroencephalogram revealed diffuse slowing. Pneumoencephalography showed frontal atrophy and slightly dilated lateral ventricles. Blood urea ranged from 50 to 70mg%. Transketolase erythrocyte activity revealed pentose utilization of 5.52 micro/ml/hr. Thiamine was then administered. In 3 days, improvement in consciousness, memory, and abstract thinking occurred and was later demonstrated with psychologic testing. In 5 days, gait became normal; snout, glabella, and palmarmental reflexes disappeared; and electroencephalograms increased in their background frequency. Upon discontinuation of thiamine, previous difficulties returned. Remission was again obtained by administration of thiamine. These observations may explain the cases of pontine myelinolysis and Wernicke-Korsakoff syndrome occasionally encountered in hemodialysis. Thiamine therapy should therefore be considered in dialysis dementia. (Author abstract modified)

252131 Sishta, S. K.; Templer, D. I. Waterford Hospital, St. John's, NF A1C 5T9, Canada **Levodopa in Huntington's chorea.** *Canadian Medical Association Journal* (Toronto). 114(9):798-799, 1976.

The efficacy of levodopa therapy in Huntington's chorea is assessed. Sixteen patients with Huntington's chorea were treated for periods as long as 8 months with levodopa. The condition of none of the patients improved; in fact, there appeared to be an exacerbation of chorea and dementia in addition to undesirable behavioral changes. Therefore, future use of levodopa in these patients is not warranted. The postulated association of low homovanillic acid values in cerebrospinal fluid and favorable response to levodopa therapy was not borne out. 7 references. (Author abstract modified)

252136 Glick, E. N. Chase Farm Hospital, Enfield, England **A clinical trial of Tofranil in osteo-arthritis.** *Journal of International Medical Research* (Northampton). 4(2):20-22, 1976.

In a paper presented at a symposium on psychotropic drugs and pain, Stratford-upon-Avon, England, a double-blind crossover trial of Tofranil (imipramine) conducted to determine if imipramine relieves joint pain (specifically the knee) in osteoarthritis is reported. Tofranil, 25mg three times daily, and

a matching placebo were given for 3 weeks to patients without acute inflammation, inflammatory disease, acute psychological illness, or contraindications to Tofranil. Each patient received 2 weeks of physiotherapy before beginning the medication. Results are nonconclusive, although in some cases the effect was negative, while in others there appeared to be a difference between the two treatment periods. 1 reference.

252138 Jenkins, D. G.; Ebbutt, A. F.; Evans, C. D. Royal Air Force, Chessington, England *Tofranil in the treatment of low back pain*. *Journal of International Medical Research* (Northampton). 4(2):28-40, 1976.

In a paper presented at the symposium on psychotropic drugs and pain, Stratford-upon-Avon, England, a description is given of a double-blind, between group comparison of Tofranil, an imipramine hydrochloride, and placebo in 59 patients suffering from low back pain in a medical rehabilitation unit. Patients were given 25mg of either Tofranil or placebo three times a day for 4 weeks. Over the whole sample there was no significant benefit for Tofranil over placebo as regards physical measurements. Both Tofranil and placebo groups showed a significant improvement during the trial on straight leg raise and backward flexion. For lateral flexion the Tofranil group was significantly worse than the placebo group on entering the trial, and during the trial the Tofranil group improved to match the placebo group. The clinician's pain and stiffness assessments and the patients' pain and stiffness assessments show a significant improvement for both the Tofranil and placebo groups during the trial. However, no difference between Tofranil and placebo, and only a marginal improvement over initial condition were noted. Further analysis according to initial diagnosis showed nothing conclusive. Numerically, the use of Tofranil produced a marked improvement in pain and stiffness in patients with disc lesion only diagnosis, whereas placebo did not produce an improvement; however, this observation was far from reaching statistical significance. Side-effects were not severe for either drug. 10 references. (Author abstract modified)

252143 Twycross, R. G. St. Christopher's Hospice, Lawrie Park Road, London, England *The measurement of pain in terminal carcinoma*. *Journal of International Medical Research* (Northampton). 4(2):58-67, 1976.

In a paper presented at a symposium on psychotropic drugs and pain, Stratford-upon-Avon, England, an experimental comparison of the analgesic properties of diamorphine and morphine in 699 patients with terminal carcinoma is reported. The experimental procedure is described in detail and recommended as a paradigm for comparing the analgesic properties of narcotics. Results indicate that there is no overall clinical difference between the two drugs when administered by mouth every 4 hours at individually optimized doses in association with cocaine and a phenothiazine. The validity, reliability, and sensitivity of the experimental procedure are discussed. 25 references.

252230 Kales, Anthony; Bixler, Edward O.; Scharf, Martin; Kales, Joyce D. Sleep Research and Treatment Center, Department of Psychiatry, Milton S. Hershey Medical Center, Hershey, PA 17033 *Sleep laboratory studies of flurazepam: a model for evaluating hypnotic drugs*. *Clinical Pharmacology and Therapeutics*. 19(5):576-583, 1976.

The results from six separate evaluations of flurazepam (30mg) in the sleep laboratory were combined to determine the effectiveness of the drug in inducing and maintaining sleep and its effects on sleep stages in a large sample of insomniac sub-

jects. The combined studies provide a model from which a detailed profile of the effects of a hypnotic drug over short-term, intermediate term, and long-term conditions can be thoroughly evaluated. Although sleep was significantly improved on the first night of flurazepam administration, peak effectiveness of the drug did not result until the second and third consecutive drug nights. Flurazepam continued to be effective in inducing and maintaining sleep with intermediate term and long-term drug use with only a slight loss of effectiveness with long-term use. Sleep was also significantly improved on the first and second nights of drug withdrawal. Carryover effectiveness of active metabolites of flurazepam from one drug night to the next drug night and to withdrawal nights is discussed. The clinical implications are discussed with regard to the time of peak effectiveness of the drug, dosage recommendations and schedule, minimizing possible effects of the drug on daytime performance, and the rationale and method for using drug holidays in the treatment regimen. The effects of flurazepam on rapid eye movement sleep are detailed. 16 references. (Author abstract modified)

252381 Basker, M. A.; Anderson, J. A. D.; Dalton, R. no address *Migraine and hypnotherapy*. *International Journal of Clinical and Experimental Hypnosis*. 24(3):353, 1976.

In a paper presented at the 7th International Congress of Hypnosis and Psychosomatic Medicine, July, 1976 in Philadelphia, a method for investigating the value of autohypnosis in migraine was described by means of a controlled trial with prochlorperazine. Random allocation was made of 47 patients to one or other prophylactic measure. This was followed by monthly assessments and independent evaluation of 1 year of continuous care. Criteria of improvement were the number of attacks per month, number who had grade 4 attacks, and number who had complete remission. Results showed that the number of attacks and the number who suffered blinding attacks were significantly lower for the group receiving hypnotherapy than for the group receiving prochlorperazine. For the hypnotherapy group these two measures were significantly lower when receiving hypnotherapy than when on previous treatment. Ten out of 23 patients receiving hypnotherapy achieved complete remission during the last 3 months of the trial as opposed to only 3 out of 24 patients on prochlorperazine. It is concluded that further trials of hypnotherapy are justified against some other treatment not solely associated with the ingestion of tablets. (Author abstract modified)

252450 Csillag, M.; Gimes, G.; Kiss, C.; Sebo, J.; Toth, F.; Toth, K.; Bolla, K. First Department of Gynaecology, Semmelweis University Medical School, Budapest, Hungary *The treatment of climacteric syndrome with tolfopam (Grandaxin)*. *Therapia Hungarica* (Budapest). 23(4):164-168, 1975.

Results of clinical trials of the minor tranquilizer Grandaxin in the treatment of menopausal symptoms are presented. Grandaxin was administered to 172 menopausal women. In the majority of cases (with complaints of mild to moderate symptom intensity) it decreased or controlled the psychic and neurovegetative symptoms when given as a single agent. The drug ameliorates the general condition of the patients by moderating the majority of complaints, and by increasing the tolerance of symptoms. In several cases when hormone therapy is indicated, Grandaxin prolongs the hormone effect and reduces the frequency of hormone administration. The safety of Grandaxin treatment is emphasized. Its great advantage is felt to be that it does not influence the daily working ability of the patients. 28 references. (Author abstract modified)

252694 Mendoza, Carlos. Veterans Administration Hospital, Fresno, CA Clinical applications of a new rationale in the treatment of acute alcohol withdrawal. Newsletter for Research in Mental Health and Behavioral Sciences. 18(2):35-37, 1976.

A detoxification procedure for alcoholic patients is described. The treatment program consists of the administration of Librium (100mg intramuscularly on admission and every four hours as needed); dyazide (one capsule given twice daily); magnesium sulfate (2cc of a 50% solution, given intramuscularly on admission and four times daily); thiamine HCL (200mg orally, three times daily); and hexavitamins (2 tablets, four times daily). In the event of seizures or a past history of seizures due to alcohol withdrawal, 100mg of Dilantin in capsule form four times daily is added. Routine laboratory tests are done as soon as possible. The treatment program has been used in nearly 1000 patients in the Fresno VA Hospital and excellent recovery was obtained within 24 to 48 hours. No fatalities, serious complications or side-effects occurred. In recalcitrant cases the procedure was repeated three or four times a year without difficulty. Delirium tremens and withdrawal symptoms were aborted when present or prevented when a history of such symptoms existed. 3 references.

252713 Stoica, E.; Enulescu, O.; Stanesco, A. Institute of Neurology and Psychiatry of the Academy of Medical Sciences, Bucharest, Romania The influence of pyridoxin-hyperventilation association on CSF lactate in cerebral infarction patients. Neurologie et Psychiatrie (Bucuresti). 13(4):293-300, 1975.

Effects of a combination of pyridoxin application and hyperventilation (HV) on cerebrospinal fluid (CSF) and peripheral venous blood lactate are investigated in cerebral infarction patients. The pyridoxin/HV association systematically induced an increase in CSF lactate without significantly changing the venous blood lactate, while the drug or HV applied alone failed to influence the level of CSF lactate. The increased CSF lactate noticed after the combination is attributed to an activation of glycolysis. It is suggested that HV facilitates the neurometabolic effect and hence, the therapeutic effectiveness of the drug by promoting its transfer into the CNS. 18 references. (Author abstract modified)

252793 Rosenberger, Peter B.; Wheelden, Julie A.; Kalotkin, Madeline. Massachusetts General Hospital, Boston, MA 02114 The effect of haloperidol on stuttering. American Journal of Psychiatry. 133(3):331-334, 1976.

Haloperidol was compared with placebo in the treatment of eight young adult stutterers in a double-blind crossover study involving six sequential observations over periods of 6 to 12 weeks. The drug was found to have a significant effect on the percentage of time subjects were dysfluent but not on the number of dysfluencies per minute. Possible reasons for this finding are discussed. 8 references. (Journal abstract)

252798 Garfinkel, B. D.; Webster, C. D.; Sloman, L. no address /Methodology used in assessing methylphenidate and caffeine treatment of minimal brain dysfunctioning children./ Dr. Garfinkel and associates reply. American Journal of Psychiatry. 133(3):345-346, 1976.

Reply is made to critical comment on the authors' research in methylphenidate and caffeine treatment of minimal brain dysfunctioning children. The contention that the study involved an inadequate sample (eight children) is challenged, suggesting that the small sample design was preferable in order to detail the drugs' effects on the performance of individual

children. Failure to adjust the dosage to fit each individual child in favor of a fixed, low dosage for all Ss is attributed to research limitations and the considerable administrative complexity that would be caused by adjusting dosage level to fit each child. Reference is made to a study which incorporated a double-blind crossover design to analyze behavioral changes in response to 150mg and 300mg caffeine alone and in combination with a fixed dosage of methylphenidate. 2 references.

253050 Rada, Richard T.; Kellner, Robert. University of New Mexico, School of Medicine, Albuquerque, NM 87106 The effects of thiothixene in geriatric patients with chronic organic brain syndrome. Psychopharmacology Bulletin. 12(2):30-32, 1976.

The effectiveness and safety of the use of thiothixene in a group of geriatric patients with chronic organic brain syndrome is evaluated in a study reported at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. Sixty three geriatric patients hospitalized with organic brain syndrome were randomly given either thiothixene or placebo in a double-blind study and were periodically rated. Results indicate that the differences between thiothixene and placebo are not conspicuous or statistically significant. These data, therefore, do not support the effectiveness or thiothixene over placebo in the treatment of organic brain syndrome. Considering the age of this patient population, the incidence of side-effects was low and their severity was mild. It is concluded that these data support the safety of thiothixene with geriatric patients. At present, however, there is no evidence of its efficacy in chronic organic brain syndrome. 8 references.

253054 Vergara, L. E.; Ban, T. A.; Lehmann, H. E.; Stewart, J. A. Hospital Psiquiatrico Nacional, Panama City, Panama. /An uncontrolled clinical trial of trazodone./ An uncontrolled clinical trial carried out in Panama City, Panama. Psychopharmacology Bulletin. 12(2):41-42, 1976.

A 12 week clinical trial carried out in Panama designed to test the therapeutic efficacy and to establish the optimal dosage range of trazodone in 10 geriatric patients is described in a paper presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada. Five male and five female geriatric patients were administered trazodone at dosages of less than 150 mg. per day for 84 days. Results show that trazodone produced statistically significant decreases in the total scores of the Modified Verdun Target Symptom Rating Scale (VTSRS) and the Plutchik Geriatric Rating Scale (PGRS); in the arousal and organic factor scores of the VTSRS; in the excitement and disorientation factor scores of the BPRS; and in four item scores of the VTSRS, seven item scores of the PGRS and four item scores of the BPRS.

253055 Lehmann, H. E.; Ban, T. A.; Hontela, S.; Nair, N. V. P.; Stewart, J. A. Douglas Hospital, Verdun, Quebec, Canada /An uncontrolled clinical trial of trazodone./ An uncontrolled clinical trial carried out in Verdun, Quebec, Canada. Psychopharmacology Bulletin. 12(2):42-44, 1976.

A 12 week clinical trial carried out in Canada designed to test the therapeutic efficacy and to establish the optimal dosage range of trazodone in 10 geriatric patients is reported in a paper presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada. The Standard ECDEU Battery was used to assess change in the patients' conditions

during an 84 day administration of 25 to 150 mg. of trazodone. Results indicate that trazodone produced statistically significant decreases in the total score of the Modified Verdun Target Symptom Rating Scale (VTSRS) and the Plutchik Geriatric Rating Scale (PGRS): in the arousal, mood, integration, and organic factor scores of the VTSRS; 10 item scores of the VTSRS; four item scores of the PGRS; and on one item score of the Brief Psychiatric Rating Scale.

253056 Torres, A.; Stewart, J. A.; Hontela, S. Division of Psychopharmacology, McGill University, Montreal, Quebec, Canada /A comparison of two uncontrolled clinical trials of trazodone./ A comparison of the two uncontrolled clinical trials. *Psychopharmacology Bulletin*. 12(2):44-45, 1976.

A comparison of two 12 week clinical trials carried out with identical protocols in Panama and Canada on psychogeriatric patients is reported in a paper presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada. A statistically significant improvement in the total scores of the Modified Verdun Target Symptom Rating Scale (VTSRS) and Plutchik Geriatric Rating Scale (PGRS) after administration of trazodone is reported. It is noted that the onset of therapeutic effect on the PGRS was significantly shorter in the Panamanian than in the Canadian population. There is also reported a significantly greater improvement on one factor of the Brief Psychiatric Rating Scale (BPRS), three items of the VTSRS, five items of the PGRS, and two items of the BPRS in the Panamanian than in the Canadian population. On the other hand, on two items of the VTSRS, one item of the PGRS, and one item of the BPRS, the Canadian population shows significantly more improvement than the Panamanian population. It is suggested that these differences were due to the lower age and the longer duration of hospitalization of the Panamanian patients or to possible racial effects.

253057 Amin, M.; Hontela, S.; Kussin, D. Reddy Memorial Hospital, Westmount, Quebec, Canada /A placebo controlled clinical trial of trazodone./ A placebo-controlled clinical trial. *Psychopharmacology Bulletin*. 12(2):45-46, 1976.

A 12 week, double-blind trial designed to test the comparative efficacy of trazodone and placebo is reported in a paper presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada. Eighteen geriatric patients were randomly assigned to one of two groups to be treated with either 50 to 150 mg. per day trazodone or placebo for an 84 day period. Results indicate that trazodone was shown to be significantly more effective than placebo on the anxiety and thought disorder items of the Modified Verdun Target Symptom Rating Scale (VTSRS). Furthermore, the trazodone treated patients exhibited a slightly (nonsignificantly) greater decrease in the total VTSRS score and in three of five factor scores than the placebo patients.

253058 Derkervorkian, K.; Ban T. A.; Hontela, S. Douglas Hospital, Verdun, Quebec, Canada /A standard controlled clinical trial of trazodone on geriatric patients./ A standard-controlled clinical trial. *Psychopharmacology Bulletin*. 12(2):46-47, 1976.

A 12 week, double-blind clinical trial designed to test the comparative efficacy of trazodone and thioridazine in 20 geriatric patient is reported in a paper presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada. The Standard ECDEU Battery was used to assess

change in patients' condition, 10 of whom were treated with trazodone, the remaining 10 being treated with thioridazine. Results indicate that trazodone was shown to be significantly more effective than thioridazine on the perceptual disturbance item of the VTSRS, on the vision, hearing, nighttime sleep and nighttime disturbances items of the Plutchik Geriatric Rating Scale and on the depressive mood item of the Brief Psychiatric Rating Scale. Thioridazine was shown to be significantly more effective on the affectivity factor and the autonomic reaction item of the Modified Verdun Target Symptom Rating Scale.

253059 Stewart, J. A.; Ban, T. A.; Lehmann, H. E. Department of Psychiatry, McGill University, Montreal, Quebec, Canada /A summary of systematic studies of trazodone. A summary of systematic studies. *Psychopharmacology Bulletin*. 12(2):47-48, 1976.

In a paper presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada, data of trazodone treated patients in four clinical trials were pooled and analysed statistically in order to reveal some of the changes of trazodone which may have remained hidden as a result of the small sample size of the individual studies. It is reported that 39 psychogeriatric patients were administered trazodone in the dosage range of 25 to 50 mg. over a 12 week period. It was found that optimal therapeutic effects were obtained with a mean of 108 mg. per day; there was some deterioration when the dosage reached 142 mg. per day. There was improvement in 71% of the patients, and the improvement was seen in all five areas of psychological functioning as indicated by the factor structure of the Modified Verdun Target Symptom Rating Scale. Improvement was first seen in the organic factor, by the end of the first week and last seen in the affectivity factor, by the end of the eighth week. The most frequently reported side effects of trazodone in this patient population were feelings of dizziness, faintness, weakness, drowsiness and excitement.

253060 Lehmann, Heinz E. Douglas Hospital, Verdun, Quebec, Canada /New psychoactive drugs in psychogeriatrics. *Psychopharmacology Bulletin*. 12(2):49-50, 1976.

The potential of centrophenoxin, pyritinol, and naftidrofuryl to treat organic dementias in geriatric patients is discussed in a paper presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada. These three recently developed compounds are considered to offer promise in the fields of secondary and primary prevention in psychogeriatrics by exerting therapeutic effects on glucose utilization, tissue respiration, and protein synthesis in the brain and by counteracting specific wear and tear changes of aging in the central nervous system. It is reported that experiments have demonstrated that centrophenoxin allows brain tissue to function better under hypoxic conditions, reduces lipofuscin in the CNS and shows psychoanaleptic effects in geropsychiatric patients. Pyritinol has been shown to increase glucose consumption in the brain and improve memory. It is reported that naftidrofuryl has been shown to improve intellectual performance and increase glucose consumption in animals. It is proposed that if these findings can be confirmed by additional clinical evidence, these drugs might become primary choices in the treatment of organic dementias. 8 references.

253061 Zung, W. W. K.; Gianturco, Daniel; Pfeiffer, Eric. Duke University Medical Center, Durham, NC 27708 Treat-

ment of depression in the aged with Gerovital H3: clinical efficacy and neurophysiological effects. *Psychopharmacology Bulletin*. 12(2):50-51, 1976.

Effects of Gerovital H3 (GH3) in the treatment of depressive disorders in the aged compared in a double-blind study with imipramine and placebo is reported in a paper presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada. Thirty geriatric outpatients were treated with one of three substances for a four week period. Comparisons of pretreatment and posttreatment scores on six rating scales measuring depression, both GH3 and imipramine treated patients improved significantly with respect to their depressive disorders, while placebo treated patients did not. Further, the results of this study show that on the Zieg self-rating depression scale and self-rating anxiety scale, change scores obtained from calculating pretreatment to posttreatment differences showed GH3 to be superior to imipramine. Results of a Mini-Mult indicate that on the D-Scale, GH3 patients had a mean decrease of 7.3, imipramine patients had a 1.6mean decrease and placebo patients had a mean increase of 1.8.

253315 Blundell, J. E. Psychology Department, University of Leeds, Leeds, LS2 9JT, England **Strategies and tactics in the use of anti-obesity drugs.** *Lancet* (London). 1(7963):804, 1976.

Strategies using antiobesity drugs are discussed, suggesting that their lack of efficacy is partly attributable to misuse. Possible reasons for such misuse are considered, and it is contended that since fat people constitute a heterogeneous population, the primary cause of eating should be determined in each case so that drug action can complement normal eating style, rather than merely suppress hunger. The assumption that anorectic drugs will have the same effect on human food intake as they do in animal consumption tests is judged unrealistic in view of the complex nature of man's eating behavior. The use of behavioral self-control procedures which bring together the medical and psychological models of obesity and may provide a more effective treatment through the combined actions of behavior modification and drug therapy, is advocated. 7 references.

253641 Wittenborn, J. Richard; Kiremitci, Nafi. Interdisciplinary Research Center, Rutgers University, New Brunswick, NJ 08903 **A comparison of antidepressant medications in neurotic and psychotic patients.** *Archives of General Psychiatry*. 32(9):1172-1176, 1975.

The responses of 225 newly hospitalized depressed women to amitriptyline hydrochloride, imipramine hydrochloride and thioridazine are compared with particular reference to the psychotic/neurotic distinction. It was found that during the first week more psychotic patients required sedation and more antidepressant medication than did neurotic patients. All treatment groups showed improvement in psychometric criteria after the first week, and there was decreasing improvement through the successive weeks. No statistically significant difference among treatments was discovered. Even though responses of the neurotic group were superior to those of the psychotic group, there was no psychometric evidence of interaction between diagnostic classification and treatment effect. Results are not considered to support the hypothesis that any one of these treatments is preferable for either neurotic patients or for psychotic patients. 10 references. (Author abstract modified)

253604 Selvini, A.; Rossi, C.; Belli, C.; Corallo, S.; Lucchelli, P. E. Rizzi Medical Division, Ospedale Maggiore Ca' Granda,

Milan, Italy **Antidepressant treatment with maprotiline in the management of emotional disturbances in patients with acute myocardial infarction: a controlled study.** *Journal of International Medical Research* (Northampton). 4(1):42-49, 1976.

Results of a controlled clinical study conducted to test the efficacy of a new antidepressant agent, maprotiline, in dealing with anxiety and depression disturbances associated with the early stages of acute myocardial infarction, are presented. The sample consisted of 126 patients, sixty three receiving orally 25mg of maprotiline twice daily and the remainder 5mg of diazepam twice daily. Treatment lasted on an average two weeks (ten days to eight weeks). The depressive and/or anxiety conditions were rated on the basis of a questionnaire administered before and after treatment. Depression was observed to improve markedly in patients receiving maprotiline, while the two drugs developed a comparable anxiolytic action. Tolerability was deemed to be good. No clinical or ECG evidence of cardiotoxic signs was detected. The importance of a drug with these characteristics in the management of emotional disturbances in the early stages of coronary artery disease is emphasized. 23 references. (Author abstract modified)

12 PSYCHOTOMIMETIC EVALUATION STUDIES

244071 Consroe, Paul F. University of Arizona, Tucson, AZ 85721 **Central actions of hallucinogenic drugs.** Final Report, NIMH Grant MH-23414, 1975. 8 p.

In a study of the central actions of hallucinogenic drugs, quantitative electroencephalographic (EEG) and gross behavioral effects of the tetrahydrocannabinol (THC) derivatives (delta9-THC and delta8-THC) of marihuana and other hallucinogens such as lysergic acid diethylamide (LSD) were delineated in experimental animals. Consideration was given to the effects of delta9-THC and delta8-THC on audiogenic seizure phenomenon in rats; the influence of methamphetamine (an adrenergic drug) and physostigmine (a cholinergic agent) on the EEG and behavioral effects of delta9-THC in rabbits; the specificity of some putative drug antagonists to the acute EEG and behavioral effects of LSD in rabbits; anticonvulsant effects of delta8-THC and delta9-THC against seizures in rats and one epileptic patient; effects of other adrenergics and caffeine on EEG and behavioral effects of delta9-THC in rabbits; effects of delta9-THC induced convulsions in THC sensitive rabbits; and acute effects of delta9-THC on squirrel monkey social behavior. 10 references.

244195 Wyatt, Richard J.; Cannon, Eleanor H.; Stoff, David M.; Gillin, J. Christian. Lab of Clinical Psychopharmacology, Div. Special Mental Health Research, IRP, NIMH, St. Elizabeths Hospital, Washington, DC 20032 **Interactions of hallucinogens at the clinical level.** (Unpublished paper). Washington, DC, NIMH, 1976. 63 p.

Tolerance and cross-tolerance of hallucinogens, as well as the interactions of hallucinogens with drugs used to treat "bad trips", are reviewed. Interactions of the hallucinogens lysergic acid diethylamide (LSD), N,N-dimethyltryptamine (DMT), psilocybin, mescaline, and 5-methoxy-DMT, with the antipsychotic substances chlorpromazine, reserpine, adrenergic and serotonergic blockers, monoamine oxidase inhibitors, and a variety of other substances are discussed. It is noted that when assessing interactions between drugs, in particular the effects of various pretreatments on the actions of hallucinogens, it is important to consider the effects produced by the pretreatment drug alone. Clinical and animal research results indicate that chlorpromazine is a dose dependent antihallucinogen, whose action may be largely related to its seda-

tive effects. Reserpine, on the other hand, appears to potentiate most effects of hallucinogens. Adrenergic blockers appear to act as incomplete antagonists of most hallucinogens. Clinically, the drugs of choice for treatment of adverse effects of hallucinogens are most often the phenothiazine antipsychotics, especially chlorpromazine. 108 references.

248628 Lemberger, Louis; Rowe, Howard. Lilly Laboratory for Clinical Research, Marion County General Hospital, Indianapolis, IN 46202 **Clinical pharmacology of nabilone, a cannabinol derivative.** *Clinical Pharmacology and Therapeutics*. 18(6):720-726, 1975.

Clinical pharmacologic data are presented on the effects of single oral doses of nabilone, as well as of repeated doses of nabilone in normal volunteers. Nabilone is a modified cannabinol derivative with central nervous system activity. Administration of nabilone in single doses of 1mg to 5mg results in dose related pharmacologic effects in man. One and 2.5mg doses of nabilone induced relaxant and sedative effects in all subjects. No euphoria, dry mouth, tachycardia, or postural hypotension was seen after 1mg, minimal effects were seen after 2.5mg, and marked effects were seen after 5mg. Effects were evident within 60 to 90min and persisted for 8 to 12 hr. Nabilone produced no significant tachycardia. There were no changes in supine blood pressure; however, marked postural hypotension occurred after the 5mg dose. The administration of nabilone at doses of 1mg or 2mg two times daily resulted in euphoria and dry mouth during the first two days of drug; thereafter tolerance developed to these effects but there was no apparent decrease in relaxation. Subjects challenged with a single 5mg dose of nabilone showed a 66% reduction in symptoms and signs after the 7 day drug period compared to that of the same dose after 1wk of placebo. Comparison of nabilone with other cannabinol derivatives suggests that some of the undesirable pharmacologic effects can be separated within the group. 11 references. (Author abstract modified)

251071 Wallin, B. Gunnar; Konig, Ulf. Department of Clinical Neurophysiology and Anaesthesiology, University Hospital, Uppsala, Sweden **Changes of skin nerve sympathetic activity during induction of general anaesthesia with thiopentone in man.** *Brain Research (Amsterdam)*. 103(1):157-160, 1976.

Profound changes of human skin nerve sympathetic activity (SSA) occurring during the induction of general anaesthesia with thiopentone in two male and female subjects in connection with elective abdominal surgery is discussed. Depth of anaesthesia, heart rate and respiratory movements were monitored. Neural recordings were made with tungsten microelectrodes inserted manually into a skin nerve fascicle in the right peroneal nerve at the fibular head. Adjustments were made until a recording position was found where spontaneously occurring sympathetic impulses could be recorded. Results show that induction of general anaesthesia with thiopentone has a marked depressant effect on the outflow of sympathetic impulses to the skin, becoming more pronounced as the anaesthesia deepens. It is not revealed whether the depression is due to a specific barbiturate effect on SSA or the effect of the unconscious state. 8 references.

253587 Weber, A.; Jermini, C.; Grandjean, E. P. Department of Hygiene and Work Physiology, Swiss Federal Institute of Technology, Zurich, Switzerland **Relationship between objective and subjective assessment of experimentally induced fatigue.** *Ergonomics (London)*. 18(2):151-156, 1975.

A laboratory study investigated the effect of fatigue induced in air traffic controllers by the oral intake of 5 mg of diazepam

on the critical fusion frequency (CFF); at the same time a subjective assessment of the effect of the drug was obtained with the aid of a bipolar questionnaire. The doses caused a significant decrease in the CFF, as well as a shift towards tiredness in self-assessment. Significant correlations obtained by Spearman's method are seen to exist between the decrease in the CFF and the opposing pairs: refreshed/tired, awake/sleepy, strong/weak and vigorous/exhausted. This indicates that people showing a sharp decrease in the CFF also demonstrate a greater deviation in the self-rating procedure towards items characteristic for a state of fatigue. It is concluded that in people who are not under mental stress, the drug alters the sensation of fatigue and not the individual frame of mind. 8 references. (Author abstract modified)

13 MECHANISM OF ACTION: PHYSIOLOGICAL, BIOCHEMICAL AND PHARMACOLOGICAL

243086 Rane, Anders; Hojer, Bengt; Wilson, John T. Division of Clinical Pharmacology, Vanderbilt University School of Medicine, Nashville, TN 37232 **Kinetics of carbamazepine and its 10,11-epoxide metabolite in children.** *Clinical Pharmacology and Therapeutics*. 19(3):276-283, 1976.

The plasma steady state concentration of carbamazepine (CBZ) and its metabolite (carbamazepine-10,11-epoxide, CBZ-epoxide) was assessed in 43 children (2 to 15 years of age) on CBZ (Tegretol) treatment. Twenty of the children received combined treatment with other anticonvulsant drugs simultaneously. Only a weak correlation was noted between dose and plasma CBZ concentration in the group of children on single drug treatment, and there was no correlation in the group of children on combined drug regimen. Plasma levels of CBZ correlated with those of the metabolite. Children on combined treatment had lower CBZ concentration and, expressed as a percent of the parent drug, the metabolite concentration was significantly higher than in children treated only with CBZ. In two children the plasma half-life of CBZ was estimated and found to be slightly shorter than had previously been reported in adults. In evaluating the plasma level/effect relationship of CBZ, it is suggested that the plasma concentration of the CBZ-epoxide be measured simultaneously because of its anticonvulsant effect and interindividual variability. 22 references. (Author abstract modified)

243089 Gram, Lars F.; Reisby, Niels; Ibsen, Ilse; Nagy, Adam; Dencker, Sven J.; Bech, Per; Petersen, Gorm Odden; Christiansen, Johannes. Department of Pharmacology, 20, Juliane Maries Vej, DK-2100 Copenhagen, Denmark **Plasma levels and antidepressive effect of imipramine.** *Clinical Pharmacology and Therapeutics*. 19(3):318-324, 1976.

The relationship between the antidepressive effect of imipramine and the plasma concentrations of imipramine and the active metabolite desipramine were studied in 24 patients suffering from endogenous depression. After a placebo period of 7 days, the patients received imipramine, 75mg three times a day. The dose was reduced in patients with pronounced side-effects. Blood samples for drug assay were drawn in the morning, 15 hr after the last drug intake. Imipramine and desipramine in plasma were assayed by quantitative *in situ* thin-layer chromatography. Individual variations in plasma concentrations were 20 to 30 fold in both imipramine and desipramine. Severity of depression was assessed on the Hamilton Rating Scale (HRS). Eleven of 12 patients who responded satisfactorily to the treatment had plasma concentrations at or above 45mg/L, and desipramine greater than 75mg/L, whereas the 12 patients not responding satisfactorily

all had concentrations of imipramine or desipramine or both below these limits. 18 references. (Author abstract)

243819 Post, Robert M.; Goodwin, Frederick K. Section on Psychobiology, Adult Psychiatry Branch, NIMH, Bethesda, MD 20014 Clinical evidence for neurochemical adaptation to psychotropic drugs. Bethesda, MD, NIMH, 1975. 5 p.

Evidence is reviewed which suggests that time dependent on compensatory mechanisms may occur in response to chronic administration of neuroleptics in animals and man. In particular, more than 10 studies in animals suggest that increases in dopamine turnover or homovanillic acid in the neostriatum associated with acute neuroleptic administration are less prominent with more chronic treatment. Evidence for such an effect in man is presented and its possible relationship to the onset and time course of clinical efficacy of the neuroleptics chlorpromazine, thioridazine, and pimozide is suggested. It is felt that further specific dissection of the relationship of the onset and time course of clinical efficacy of the neuroleptics to biochemical parameters may help reveal biological/behavioral interactions involved in the etiology and treatment of some acute psychotic disorders. 5 references.

244131 Belpaire, F. M.; Vanderheeren, F. A. J.; Bogaert, M. G. J. F. & C. Heymans Instituut voor Farmakodynamie en Therapie, De Pintelaan 135, B-9000 Ghent, Belgium Binding of thioridazine and some of its metabolites to human serum protein and human albumin. *Arzneimittel-Forschung (Aulendorf)*. 25(12):1969-1971, 1976.

The binding of thioridazine (a neuroleptic drug of the phenothiazine group) and some of its psychoactive metabolites to human serum and to human albumin was studied using equilibrium dialysis. Serum was obtained from seven healthy Ss with no recent history of drug intake and from four chronic schizophrenics who had been taking thioridazine for at least 2 years. A very important binding capacity was found for each of the products tested, but significant differences between binding to human serum and binding to human albumin were observed. Binding in schizophrenics was not significantly different from binding in normals. 10 references. (Author abstract modified)

244591 Muzio, M.; Gabrielli, F.; Balestra, V. Istituto di Psichiatria, Università di Genova, Genoa, Italy / "Serum lithium curve and clinical-psychometric variables": preliminary experiments. / "Curva litiemica da carico e variabili clinico-psicometriche": esperienza preliminare. *Rassegna di Studi Psichiatri (Siena)*. 64(6):895-914, 1975.

Serum lithium concentration was determined after a single dose of lithium (900mg) was administered to 26 patients divided into a dysthymic group and a dissociative group. Remarkable heterogeneity of behavior was revealed. In particular, in two subjects the maximum value was attained very late (delayed peak). Among the remaining Ss (early peak), the male schizophrenics attained the maximum level later and with lower mean levels (with a statistically significant difference). There was also a moderate positive correlation between age and maximum serum lithium values in the dysthymic patients. 26 references. (Journal abstract modified)

244960 Mendelson, Wallace B.; Goodwin, Donald W.; Hill, Shirley Y.; Reichman, John D. Building 10, Rm 3N224, NIMH, 9000 Rockville Pike, Bethesda, MD 20014 The morning after: residual EEG effects of triazolam and flurazepam, alone and in combination with alcohol. *Current Therapeutic Research*. 19(2):155-163, 1976.

Residual electroencephalographic (EEG) effects of two benzodiazepines, triazolam and flurazepam, alone and in combination with alcohol were studied. Forty-seven young adults received 30mg flurazepam, 0.25mg triazolam, or placebo, alone or in combination with 0.8g/kg of alcohol. Using a system of EEG interpretation shown to be valid for determining drug effects under these conditions, EEGs were analyzed 16 hours after administration. These were no detectable residual effects from either drug alone or triazolam combined with alcohol. Compared to placebo, there were residual effects from flurazepam and alcohol together. Implications regarding possible cumulative effects during chronic administration of flurazepam are considered. 17 references. (Author abstract)

245233 Sandler, M.; Carter, Susan Bonham; Cuthbert, M. F.; Pare, C. M. B. Inst. of Obstetrics and Gynecology, Queen Charlotte's Maternity Hospital, London, W6, England Is there an increase in monoamine-oxidase activity in depressive illness? *Lancet (London)*. No. 7915:1045-1048, 1975.

In a study of the relation of monoamine oxidase (MAO) level and depressive illness, in a group of depressed patients who had either been treated with or considered suitable for MAO inhibitor therapy, a highly significant decrease in conjugated tyramine output following an oral tyramine load was found, as compared with a group of normal controls. However, there was no difference in conjugated isoprenaline output between the two groups after isoprenaline ingestion, even though this amine is almost solely metabolized by what is likely to be the same conjugation mechanism. While some explanation in terms of altered gut mobility is conceivable, it is considered likely that the apparent deficit in tyramine conjugation in depression represents an increase in functional MAO activity. Consequently, this enzyme would metabolize a greater proportion of available amine, causing a proportionately larger decrease in the smaller conjugate pool. It is concluded that the administration of MAO inhibiting drugs may be the most rational form of treatment for some depressed patients. 41 references. (Author abstract modified)

245307 Goldman, Peter; Peppercorn, Mark A. Beth Israel Hospital, 300 Brookline Avenue, Boston, MA 02215 Drug therapy: sulfasalazine. *New England Journal of Medicine*. 293(1):20-23, 1975.

A clinical study on the effectiveness of sulfasalazine compared to salicylazosulfadimidine and placebo in the treatment of ulcerative colitis is reported. Pharmacokinetic studies indicate that the drug is absorbed in the upper gastrointestinal tract. Speculation on the mechanism of action of sulfasalazine in ulcerative colitis is presented and discussed. Drug interactions and adverse reactions to sulfasalazine are also discussed. 34 references.

245647 Teychenne, Paul F.; Calne, Donald B.; Lewis, Peter J.; Findley, Leslie J. Royal Postgraduate Medical School, London, England Interactions of levodopa with inhibitors of monoamine oxidase and L-aromatic amino acid decarboxylase. *Clinical Pharmacology and Therapeutics*. 18(3):273-277, 1975.

Drug interactions between levodopa, tranylcypromine, and carbidopa were studied in four patients with idiopathic parkinsonism. Pressor responses were induced by a combination of levodopa and tranylcypromine. These hypertensive reactions were inhibited by carbidopa, indicating that they are mediated at the periphery. Very small doses of levodopa induced an improvement in parkinsonism when patients were concomitantly taking carbidopa and tranylcypromine, but adverse reactions were prominent. Results are considered to confirm the danger

of a combination of levodopa with a monoamine oxidase inhibitor, and to show that the ability to suppress the hypertensive reaction in animals with an extracerebral decarboxylase inhibitor can be reproduced in human subjects, implying that the pressor response to levodopa in man is mediated outside the central nervous systems. 12 references. (Author abstract modified)

245651 Recker, Robert R. Department of Medicine, Creighton University School of Medicine, 2305 S. 10th St., Omaha, NE 68108 **Effect of hydrochlorothiazide on phosphorus during treatment with diphosphonate.** *Clinical Pharmacology and Therapeutics*. 18(3):345-349, 1975.

The effects of probenecid and hydrochlorothiazide on renal handling of phosphorus during hyperphosphatemia induced by disphosphonate (ethane-1-hydroxy-1, 1-diphosphonate, EHDP) was studied. Measurements of calcium, phosphorus, and creatinine clearance were performed in 2 sessions on each of 3 consecutive days in 10 normal fasting volunteers during the hours from 8 A.M. to 12 noon. During the next 2 or 3 weeks, Ss were treated with EHDP, 30mg/kg/day. A second study utilized the same approach except that EHDP administration continued throughout. EHDP caused elevation of serum phosphorus in all cases, while probenecid did not affect urine phosphorus. Hydrochlorothiazide caused a transient phosphaturia of similar magnitude in the EHDP treated and untreated stages. Creatinine clearance was not affected by any treatment and urine calcium was decreased by EHDP. It is concluded that hydrochlorothiazide inhibits tubular reabsorption of phosphorus, but that it does not affect the mechanism whereby EHDP causes increased tubular reabsorption of phosphorus. Further, chronic administration of hydrochlorothiazide along with EHDP is thought to inhibit hyperphosphatemia and may change the bone effects of EHDP. 13 references. (Author abstract)

245653 Alvan, Gunnar; Orme, Michael; Bertilsson, Leif; Ekstrand, Roger; Palmer, Lena. Department of Clinical Pharmacology, Huddinge Hospital, S-141 86 Huddinge, Sweden **Pharmacokinetics of indomethacin.** *Clinical Pharmacology and Therapeutics*. 18(3):364-373, 1975.

Plasma concentrations of indomethacin were studied in 5 healthy volunteers after single and multiple doses (25mg intravenously, 25, 50, and 100mg orally, 100mg rectally, and 25mg 3 times daily). In eight other normal Ss and in five patients a 50mg oral dose was given and the indomethacin concentration was followed from 8 to 32hr. after dosing. After oral and rectal doses, the plasma decay of indomethacin was biphasic. The half-line of the beta phase varied between 2.6 and 11.2hr. Volume of distribution ranged from 0.34 to 1.57 L/kg and the plasma clearance from 0.044 to 0.109kg/hr. No dose dependent elimination occurred. Indomethacin was rapidly and well absorbed after oral dosing with peak plasma concentrations within 2hr. Comparison with the area under the curve (AUC) after intravenous dosing showed complete bioavailability. The AUC after rectal dosing was the same but the rate of absorption was slower than after oral administration. Indomethacin, 25mg 3 times daily, was also given for 9 days to the same normal Ss. Equilibrium concentrations did not differ significantly from those predicted from single dose data in the five Ss. 20 references. (Author abstract modified)

245822 Fowlkes, D. Karrol. no address **Toxicology update of the Arkansas poison control-drug information center: the tricyclic antidepressants.** *Journal of the Arkansas Medical Society*. 72(7):285-289, 1975.

The characteristics of the tricyclic antidepressants are discussed. Although the tricyclic antidepressants are involved in only a small percentage of reported accidental ingestions and suicide attempts, a large proportion of such poisonings are fatal. The structural similarities between the tricyclic antidepressants and the phenothiazines are noted. The effects of the drugs on the central nervous system, the autonomic nervous system, the cardiovascular system and respiration are described. The uses of the drugs in treating depression are noted. The subject of toxicity is treated in detail, and a summary of therapeutic intervention for poisoning cases is included. 7 references.

245840 Sachar, Edward J.; Gruen, Peter H.; Karasu, Toksoz B.; Altman, Norman; Frantz, Andrew G. Bronx Municipal Hospital Center, Eastchester Road and Pelham Parkway S., Bronx, NY 10461 **Thioridazine stimulates prolactin secretion in man.** *Archives of General Psychiatry*. 32(7):885-886, 1975.

A study is made of thioridazine, which, unlike most other effective antipsychotic drugs, appears to be only a weak dopamine antagonist in various regions of the brain. Thioridazine was tested for its effects on another brain dopaminergic system, the tuberoinfundibular tract, which regulates prolactin secretion by stimulating hypothalamic secretion of prolactin inhibiting factor. Chlorpromazine and several other phenothiazines were shown to stimulate prolactin secretion. Five healthy men ingested 50 mg of chlorpromazine concentrate on one occasion, and 50 mg of thioridazine concentrate on another. Both drugs noticeably stimulated prolactin secretion within two hours. It is concluded that thioridazine is a potent dopamine antagonist in the tuberoinfundibular system, and that this system's regulation of prolactin secretion may provide a useful method for studying antipsychotic drug effects in man. 24 references. (Author abstract modified)

245856 Gillies, A. H. B.; Shellshear, I. D. Christchurch Hospital, Christchurch, New Zealand **Unwanted corticosteroid effects in childhood bone marrow failure, renal failure and brain damage: case report.** *New Zealand Medical Journal* (Dunedin). 81(539):424-427, 1975.

The case report of the corticosteroid complication in an 8 year old girl with immune thrombocytopenic purpura is presented. After treatment with high dosage corticosteroids, severe side-effects occurred, including bone marrow depression, renal magnesium stones, osteoporosis, depression of affect, convulsions with cerebral damage and adrenal suppression. Corticosteroids are considered powerful therapeutic agents with profound physiological and pharmacological effects. With high doses a higher incidence and greater severity of side-effects is inevitable. It is concluded that corticosteroid doses should be no more than the minimum necessary to achieve the desired result. 22 references.

246275 Mallinger, Alan G.; Kupfer, David J.; Poust, Roland I.; Hanin, Israel. Western Psychiatric Institute and Clinic, Dept. of Psychiatry, 3811 O'Hara St., Pittsburgh, PA 15261 **In vitro and in vivo transport of lithium by human erythrocytes.** *Clinical Pharmacology and Therapeutics*. 18(4):467-474, 1975.

An in vitro system that can be used to measure both uptake and efflux of lithium by erythrocytes (RBCs) is described. Using this system, RBC lithium accumulation in vitro was compared with in vivo RBC lithium concentrations observed in six normal volunteers. A significant correlation was demonstrated between in vitro RBC lithium accumulation after 48hr incubation and in vivo RBC lithium concentration at 24, 48, 72, and 96hr following the beginning of lithium ingestion. In

addition, when efflux of lithium from RBCs in vitro was studied, a significant correlation was observed between residual lithium in RBCs and in vitro RBC lithium accumulation. Finally, it was demonstrated that storage of blood in ice for 5hr prior to incubation with lithium results in increased RBC lithium accumulation. A potential role for this in vitro incubation system as a model for in vivo RBC lithium accumulation is suggested. 23 references. (Author abstract)

246304 Kay, David C. NIDA Addiction Research Center, P. O. Box 12390, Lexington, KY 40511 **Human sleep during chronic morphine intoxication.** *Psychopharmacologia* (Berlin). 44(2):117-124, 1975.

The sleep of six opiate addicts was studied for 11 nights during three phases of a chronic morphine cycle. The control phase consisted of five consecutive nights before morphine administration; the induction phase consisted of one night at 21 to 36 days after the onset of morphine administration, when the daily dose was 140 to 220mg; and the stable dose phase consisted of five consecutive nights after the subjects had received 240mg of morphine daily for 8 to 19 weeks. Sleep was continuously monitored with EEG, EMG and EOG. Results show that chronic morphine produced signs of small but persistent sleep disturbance: delta sleep (early night) became less stable and shifted toward later in the night, waking state increased during the middle of the night, REM sleep (especially its activated EEG without eye movements) decreased, the REMS cycle increased, and bursts of delta activity (with mean duration of 5 to 6sec) increased. With chronic morphine, therefore, partial tolerance develops to the sleep disturbance produced by morphine. The small but persistent nocturnal arousal during chronic morphine contrasts with the sedation seen during chronic methadone. Both opioids produce an increase in delta bursts during chronic administration, which might be an EEG phenomenon specific to chronic opioid intake. 36 references. (Author abstract modified)

246305 Macavoy, Michael G.; Marks, David F. Psychology Dept., Univ. of Otago, Box 56, Dunedin, New Zealand **Divided attention performance of cannabis users and non-users following cannabis and alcohol.** *Psychopharmacologia* (Berlin). 44(2):147-152, 1975.

The effects of delta 9-tetrahydrocannabinol (delta 9-THC) and alcohol, and their combination, on divided attention performance are compared for cannabis users and nonusers of both sexes. Performance by all subjects was significantly impaired following 2.6 and 5.2mg delta 9-THC but not at blood alcohol concentrations of 48 and 96mg/100 ml. The combined effect of the two drugs is considered to depend upon prior experience with cannabis. A synergistic action occurred in nonusers while an antagonistic effect occurred in the group of users. Differences in the alcohol effects between users and nonusers are felt to provide evidence of cross-tolerance between cannabis and alcohol. 31 references. (Author abstract)

246312 Gentil, V.; Greenwood, M. H.; Lader, M. H. Clinical Psychopharmacology Section, Inst. of Psychiatry, Univ. of London, England **The effect of adrenaline on human platelet MAO activity.** *Psychopharmacologia* (Berlin). 44(2):187-190, 1975.

The effects of subcutaneous administration of adrenaline to normal subjects platelet monoamine oxidase (MAO) activity are studied. Platelet MAO activity was determined before and after the subcutaneous administration of adrenaline to nine healthy volunteers. Significant increases were found 15min and 1hr after adrenaline in the enzymatic activity with benzylamine

acting as substrate. Increases were also found in all but two samples in the activity towards tyramine. It is felt that such increases may be part of general response to stress, and, if so, need to be taken into account when interpreting changes in platelet MAO activity in psychiatric patients. 26 references. (Author abstract modified)

246387 Nagy, Adam; Johansson, Rustan. Klinik II, Lillhagens Sjukhus, S-42203, Hisings Backa, Sweden **Plasma levels of imipramine and desipramine in man after different routes of administration.** *Archives of Pharmacology* (Berlin). 290(2-3):145-160, 1975.

To investigate the pharmacokinetics of imipramine and desipramine, five healthy volunteers received single intramuscular, oral and intravenous doses and multiple oral doses of imipramine hydrochloride on different occasions. Two of the volunteers also received single intramuscular and oral doses of desipramine hydrochloride. Great interindividual differences were noted in the plasma concentrations of imipramine and the formed desipramine after single doses of imipramine hydrochloride. In all subjects more desipramine was formed after oral than after parenteral administration of imipramine. The bioavailability of an orally administered dose of imipramine ranged between 29.5 and 54.7%. The concentration of imipramine was generally lower in the blood cells than in the plasma, unlike the concentration of desipramine which was considerably higher in the blood cells. The half-lives of imipramine ranged from 4.0 to 17.6hrs after single oral doses and between 9.2 and 20.2hrs after multiple oral doses. The half-lives of the formed desipramine ranged between 13.5 and 61.5hrs after multiple oral doses of imipramine hydrochloride. 20 references. (Author abstract modified)

246856 Dunn, Michael J.; Hunt, William. Dept. of Medicine, University of Vermont, Burlington, VT 05401 **The effects of harmaline on sodium transport in human erythrocytes: evidence in favor of action at interior sodium-sensitive sites.** *Journal of Pharmacology and Experimental Therapeutics*. 193(3):903-909, 1975.

The effects of the hallucinogen, harmaline (HME), and its congeners on human red blood cell (RBC) transport are examined. HME reduced sodium efflux by 70% at maximum inhibitory concentrations. It acted upon the ouabain sensitive component of sodium efflux, since it exerted no inhibitory actions in the presence of ouabain. When HME was incorporated into RBC ghosts by reversible hemolysis, the degree of inhibition of sodium efflux was comparable to that found with ouabain outside the red cells and was always greater than the inhibition produced with HME outside cells. HME increased membrane permeability to sodium, as shown by enhanced sodium influx into RBC, and at concentrations of 10mM caused rapid increments of intracellular sodium and decrements of intracellular potassium. It is concluded that the harmala alkaloids inhibit the active Na/K transport system in human RBC through their effects on sodium sensitive transport sites on the interior membrane surface. 17 references. (Author abstract modified)

246970 Bender, A. Douglas; Post, Alex; Meier, Joseph P.; Higson, John E.; Reichard, George, Jr. Research and Development Div., Smith Kline and French Laboratories, Philadelphia, PA 19101 **Plasma protein binding of drugs as a function of age in adult human subjects.** *Journal of Pharmaceutical Sciences*. 64(10):1711-1713, 1975.

A study which examines what influence, if any, increasing age has on the binding of drugs by plasma proteins is reported.

Plasma from healthy subjects ranging in age from 21 to 94 years was used. The binding of phenytoin (diphenylhydantoin acid), penicillin G potassium (benzylpenicillin potassium), and phenobarbitalic acid was determined by equilibrium dialysis of ¹⁴C labeled compounds. No differences were found in total protein concentration; however, albumin was reduced in subjects over 50 years of age. Plasma binding of each drug studied was not related to age; this finding suggests that age per se is not a factor in the binding of drugs by plasma proteins. 12 references. (Author abstract modified)

246992 Boiardi, A.; Bussone, G.; Caccia, M. R.; Rocca, E. Istituto Neurologico 'C. Besta', Via Celoria 11, I-20133 Milan, Italy Electrophysiological evidence for a neurohormonal dependence in the changes of the late glabellar response in man. *European Neurology* (Basel). 13(6):513-518, 1975.

In an experiment designed to confirm the presence of a neurohormonal influence in the trigemino-facial reflex circuits by reproducing a Parkinson like facilitation of the late glabellar response (LGR) normal model in man, reserpine was used to create a pharmacologically reversible blockade of the LGR habituation in 19 normal adults. Reserpine administration induced significant changes in the parameters of the second glabellar response (R2): shortening of the latency and duration; decrease of the excitability threshold and complete blockade of the physiological habituation of R2 to the electrical and mechanical stimulation. No changes in the first response (R1) were observed, and all R2 changes disappeared within about 3 days of drug administration. The Parkinson like effect of reserpine on the glabellar reflex is discussed in terms of a neurohormonal hypothesis for the control of the polysynaptic pathways biasing R2. 13 references. (Author abstract modified)

246993 Bareggi, S. R.; Porta, M.; Selenati, A.; Assael, B. M.; Calderini, G.; Collice, M.; Rossanda, M.; Morselli, P. L. Istituto di Ricerche Farmacologiche 'Mario Negri', Via Eritrea 62, I-20157 Milan, Italy Homovanillic acid and 5-hydroxyindole-acetic acid in the CSF of patients after a severe head injury. I. lumbar CSF concentration in chronic brain post-traumatic syndromes. *European Neurology* (Basel). 13(6):528-544, 1975.

A study investigating the fluctuations of acid monoamine metabolites in the cerebrospinal fluid (CSF) of patients with recent severe head injury, and the validity of administering L-Dopa to such patients, is reported. Lumbar CSF concentrations of homovanillic acid (HVA) and 5-hydroxyindole-acetic acid (5HIAA) were determined in ten patients suffering from chronic brain posttraumatic syndromes, at various intervals after the brain trauma. Lower concentrations of HVA compared to controls were observed in seven cases; 5HIAA levels were within normal values. The 5HIAA/HVA ratio was significantly higher than the one recorded in controls. Monitoring of lumbar HVA and 5HIAA over time, before, during and after L-Dopa treatment, revealed correlations between modification of clinical picture and the levels of monoamine acid metabolites. The data indicate a profound alteration of brain monoamines in chronic syndromes following a severe head injury and suggest that measurements of lumbar HVA and 5HIAA in these patients may be of diagnostic value. 45 references. (Author abstract modified)

246994 Porta, M.; Bareggi, S. R.; Collice, M.; Assael, B. M.; Selenati, A.; Calderini, G.; Rossanda, M.; Morselli, P. L. Istituto di Ricerche Farmacologiche 'Mario Negri', Via Eritrea 62, I-20157 Milano, Italy Homovanillic acid and 5-hydroxyindole-acetic acid in the CSF of patients after a severe head injury. II. ventricular CSF concentrations in acute brain post-trau-

matic syndromes. *European Neurology* (Basel). 13(6):545-554, 1975.

Observations of ventricular cerebrospinal fluid (CSF) concentrations of homovanillic acid (HVA) and 5-hydroxyindole-acetic acid (5HIAA) in patients suffering from severe brain injury or brain tumor are reported. Ventricular concentrations of HVA and 5HIAA were measured in seven patients a few days after a severe traumatic brain injury. Both acid metabolites were found to be elevated in respect to control patients values, however, the rise was more consistent of 5HIAA with a 5HIAA/HVA ratio of 0.85 plus or minus 0.35. It is concluded the data support previous hypothesis on the profound involvement of serotonergic structures in the early stages of acute traumatic brain syndromes and on the role of 5HT in maintaining edema and vasospasm. 27 references. (Author abstract modified)

247210 Gram, Lars F. Dept. of Pharmacology, University of Copenhagen 20, Juliane Maries Vej DK-2100 Copenhagen, Denmark Effects of perphenazine on imipramine metabolism in man. *Psychopharmacology Communications*. 1(2):165-175, 1975.

A study which investigated the mechanism and dose/effect relationship of the effects of perphenazine on the pharmacokinetics of imipramine in man is reported. Sixteen schizophrenic inpatients were given oral test doses of ¹⁴C-imipramine or ¹⁴C-desipramine before and during treatment with perphenazine. Analysis of the imipramine and desipramine metabolites in the subjects' urine samples revealed that the major effect of perphenazine is an inhibition of the 2-hydroxylation of imipramine and desipramine. This effect in turn caused the decreased formation and excretion of nonconjugated and glucuronide bound hydroxy metabolites and accumulation of imipramine and desipramine. There was some degree of correlation between the dose of perphenazine and the inhibition of total urinary excretion. The implications of these findings for the treatment of schizophrenia with tricyclic antidepressants are discussed. 11 references. (Author abstract modified)

248097 no author. no address Can phenytoins cause fetal damage? *Medical World News*. 17(7):26, 28, 1976.

Researchers' disagreement about the high risk of fetal defects associated with maternal use of phenytoin (diphenylhydantoin) anticonvulsants is examined. It is contended that seemingly opposite conclusions reached by two studies may be explained by the fact that one was seeking a fetal phenytoin syndrome, marked by altered growth and performance, unusual facies, and minor dysmorphic features, while the other was looking for anencephaly, hydrocephaly, microcephaly, meningomyelocele, cleft lip or palate, limb absence, polydactyly, syndactyly, and congenital cardiac defects. Differences in methodology, patient selection, and types of abnormalities are cited as complicating the effort to determine if high fetal risk is from the epileptic condition or from drug treatment. The alarming characteristics of the fetal phenytoin syndrome, which includes mild to moderate mental deficiency, are seen as warranting counseling of epileptic women before pregnancy and research on the relative dangers of risking maternal seizures by withdrawing drug treatment during pregnancy.

248224 Legros, J. J.; Demoulin, A.; Franchimont, P. Radioimmunoassay Laboratory, Dept. of Internal Medicine and Pathology, Institute of Medicine, 23 Blvd. Piercot, B-4000, Liege, Belgium Influence of chlorpromazine on the positive and

negative feed-back mechanism of oestrogens in man. *Psychoneuroendocrinology*. 1(2):185-198, 1975.

The inhibitory action of ethinylestradiol (E.E.) on follicle stimulating hormone but not on luteotropic hormone blood levels, and a stimulatory action on basal neurophysine levels and on growth hormone responsiveness to hypoglycemia is demonstrated. Chlorpromazine (CPZ), at a dosage of 100mg was not found to influence the inhibitory action of E.E., while it decreases or abolishes its stimulatory reactions. Such a dissociation in the effect of CPZ is felt to oppose a putative similarity between the central molecular receptors for these two substances. 121 references. (Author abstract modified)

248464 Gordon, Edna K.; Oliver, Jerry; Kopin, Irwin J. Laboratory of Clinical Science, National Institute of Mental Health, Bethesda, MD 20014 The effect of probenecid on catecholamine metabolites in human cerebrospinal fluid analyzed by mass fragmentography. *Life Sciences* (Oxford). 16(10):1527-1531, 1975.

The effect of probenecid on catecholamine metabolites in human cerebrospinal fluid is reported. A gas chromatography/mass fragmentography method was used to measure homovanillic acid (HVA), vanillylmandelic acid (VMA) and 3-methoxy-4-hydroxyphenethylene glycol (MHPG) in lumbar cerebrospinal fluid (CSF) of 31 patients before and after treatment with probenecid. It was found that HVA values increased from 24.6 plus or minus 2.6 S.E.M. to 210 plus or minus 17 ng/ml. The increase in VMA was from 1.06 plus or minus 0.23 to 2.22 plus or minus 0.17 ng/ml and that of MHPG was from 12.2 plus or minus 1.08 to 15.6 plus or minus 1.27 ng/ml. All increases were significant ($p < 0.01$). The results for MHPG and HVA are consistent with results of earlier studies using different methods. VMA concentrations increased significantly but at a rate much lower than those of HVA. 26 references. (Author abstract modified)

248629 Sagales, T.; Erill, S.; Domino, E. F. Department of Pharmacology, University of Michigan, Ann Arbor, MI 48104 Effects of repeated doses of scopolamine on the electroencephalographic stages of sleep in normal volunteers. *Clinical Pharmacology and Therapeutics*. 18(6):727-732, 1975.

A study was undertaken to explore whether tolerance to the effects on the EEG patterns of sleep developed after successive doses of scopolamine, and whether any rebound was apparent upon interruption of the treatment. The design consisted of a sequence of habituation, no medication, saline (control), scopolamine (0.006mg/kg intramuscularly three consecutive nights), and saline. The first dose of scopolamine markedly retarded the onset of stage rapid eye movement (REM) sleep and diminished the total amount of REM sleep during the night. A decrease in total number of eye movements and an increase in body movements were also observed. Changes after the second dose of scopolamine were less marked but still significant. The third dose of scopolamine produced less marked changes than the preceding two. When compared with the first scopolamine night, the onset of stage REM was retarded to a less extent ($p < 0.05$) and the total amount of REM sleep was increased ($p < 0.05$). An increase in the duration of the first REM period was also observed. Rebound effects on the appearance of the first REM period ($p > 0.01$), number of eye movements ($p > 0.001$), total amount of REM sleep ($p < 0.01$), and body movements were observed in the last saline night. 21 references. (Author abstract modified)

249123 Yamaguchi, Takahisa; Nomura, Junichi; Nishikubo, Mitsuhiro; Tsujimura, Ryotaro; Hatotani, Noboru. Department of Psychiatry, Mie University School of Medicine, Tsu City, Mie Prefecture, Japan Studies on thyroid therapy and thyroid function in depressive patients. *Folia Psychiatrica et Neurologica Japonica* (Tokyo). 29(3):221-230, 1975.

A number of cases are reported of depressed patients with latent hypothyroidism, possibly due to hypothalamopituitary dysfunction, who became refractory to antidepressant drugs. A dramatic improvement achieved through thyroid medication combined with tricyclic antidepressants was observed in these persistently depressed patients. It is suggested that this effect is related to the catecholamine hypothesis of depression, but the need for further investigation is stressed. 23 references. (Author abstract modified)

249367 Still, Charles N.; Herberg, Klaus-Peter. William S. Hall Psychiatric Institute, PO Box 119, Columbia, SC 29202 Long-term levodopa therapy for torsion dystonia. *Southern Medical Journal*. 69(5):564-566, 1976.

Long-term levodopa (L-Dopa) therapy for torsion dystonia is described via case example of a 34-year-old woman. Observations over a 4 year period revealed that severe side-effects (gastrointestinal problems, dyskinesias, cramps, and anxiety) occurred with maximal dosage schedules during the first 10 months of treatment. Thereafter, a gradual reduction of the daily dose gave excellent relief of hypokinesia and rigidity with minimal adverse effects, including abolition of mild akinesia paradoxa which developed after 2 1/2 years of treatment. It is contended that this is the first reported case of torsion dystonia showing the phenomenon of akinesia paradoxa during long-term L-Dopa therapy. Clearing of depression and anxiety is seen as possibly reflecting situational improvement, but it is contended that pharmacologic restoration of cholinergic/dopaminergic balance through such treatment cannot be ruled out. While the molecular biology of torsion dystonia remains incomplete, L-Dopa therapy is considered a hopeful treatment approach. 27 references.

249673 Altamura, A. C.; Morganti, A. Department of Clinical Psychiatry, University of Milan, Via Francesco Sforza 35, 20122 Milan, Italy Plasma renin activity in depressed patients treated with increasing doses of lithium carbonate. *Psychopharmacologia* (Berlin). 45(2):171-175, 1975.

Plasma renin activity (PRA) is measured in the supine position and after active upright stance in patients with endogenous depression and in a group of healthy volunteers serving as controls. In the depressed patients, PRA was further investigated in the same conditions during treatment with increasing doses of lithium carbonate. Basal PRA values were lower in depressed patients than in normal controls, particularly in the upright stance, and tended to rise gradually during lithium therapy. These findings suggest that lithium may work as a stimulant of the renin/angiotensin system, and possibly as an antidepressant, by way of producing functional activation of the norepinephrine system independent of its action on the water and electrolyte balance. 35 references. (Author abstract)

250196 Siomopoulos, V. 1601 West Taylor Street, Chicago, IL 60612 Thought disorder in amphetamine psychosis: a case report. *Psychosomatics*. 17(1):42-44, 1976.

The close resemblance of amphetamine psychosis to paranoid schizophrenia is discussed; however, it is felt that delineating the differences between them is important. It is

suggested that important clues regarding the biological mechanisms of schizophrenia may be found in investigation of amphetamine psychosis. A case of amphetamine psychosis with the type of thought impairment known as paralogic (paleologic), of which there are no known reports in the literature, is presented. Specific symptoms in this particular case include paranoid ideation of grandiose and persecutory nature, stereotyped behavior, and pseudoscientific preoccupations, which appeared only after the patient began using amphetamines. The question is raised as to whether the delusional ideas of the patient, specifically the paleologic mechanisms underlying these ideas, are a direct amphetamine effect or whether they represent an awakening by the drug of a latent schizophrenic condition. The pathogenesis of amphetamine psychosis is not known. Possible underlying pharmacological mechanisms of amphetamine psychosis are discussed and it is hypothesized that amphetamines seem to cause a state of affective (limbic) hyperarousal. It is thought that if affects (drives, fears, wishes) "take over" in schizophrenia to lead to faulty evaluations and perceptions of reality, amphetamine psychosis might as well be conceptualized as a pharmacologically induced "affective (limbic) takeover," leading to the same type of misvaluations of reality. It is felt that the case reported suggests similarities between schizophrenia and amphetamine psychosis which have not been previously explored. 11 references.

250389 Post, Robert M.; Goodwin, Frederick K. Section on Psychobiology, Adult Psychiatry Branch, National Institute of Mental Health, Bethesda, MD 20014 Time-dependent effects of phenothiazines on dopamine turnover in psychiatric patients. *Science*. 190(4213):488-489, 1975.

The effects of phenothiazines on dopamine turnover are studied in psychiatric patients on both a short-term (15 to 19 days) and long-term (25 to 77 days) basis. Patients receiving neuroleptic medications increased levels of homovanillic acid, a major metabolite of dopamine, present in their cerebrospinal fluid. Animal data indicate that phenothiazines increase dopamine turnover. Patients examined in the early stages of treatment with chlorpromazine and thioridazine showed elevated probenecid induced accumulations of homovanillic acid. In those studied after longer periods of treatment with phenothiazines, homovanillic acid levels were not elevated. The phenothiazine induced increases in dopamine turnover may be time dependent, since they are less evident after 3 weeks of treatment. In patients studied after 3 weeks of treatment (up to 77 days), homovanillic acid accumulations were no higher than in drug free persons. It is suggested that the time course of maximal antipsychotic efficacy of the phenothiazines may be related to this return of dopamine turnover toward baseline values. 27 references. (Author abstract modified)

250417 Davis, Kenneth L.; Berger, Philip A.; Hollister, Leo E. Stanford University School of Medicine, Stanford, CA 94305 Choline for tardive dyskinesia. *New England Journal of Medicine*. 293(3):152, 1975.

In a brief letter, a case study is presented demonstrating the success of choline therapy in treating patients with tardive dyskinesia. A 39 year old man with classic buccolingual-masticatory dyskinesia was treated with choline chloride (physostigmine) in an attempt to increase central cholinergic activity. Abnormal movements were decreased markedly. Upon discontinuation of treatment, symptoms returned. It is concluded that the transient improvement after intravenous physostigmine administration indicates that for some patients,

choline therapy may be of long-term therapeutic value. 6 references.

250423 Mahon, W. A.; Inaba, T.; Umeda, T.; Tsutsumi, E.; Stone, R. Department of Clinical Pharmacology, Toronto General Hospital, Toronto, Ontario, Canada Biliary elimination of diazepam in man. *Clinical Pharmacology and Therapeutics*. 19(4):443-450, 1976.

The metabolism of 14C-5-diazepam is studied in five patients with T tube biliary drainage in order to determine the extent and magnitude of biliary elimination of diazepam and its major metabolites in man. A single bolus of 40 to 50microCi was given intravenously and blood, urine, and bile were analyzed from 5 to 14 days. The mean half-life of elimination from blood was 93.2hr; the major metabolite noted in blood was N-desmethyl-diazepam. In urine the average recovery of radioactivity was 48.9% and consisted of 3 OH-diazepam, 4'OH-diazepam, and oxazepam. In bile the average recovery of radioactivity was 5.35% (corrected to a bile flow of 700 ml was 15.0%) and consisted of the same metabolites as in the urine. Essentially no diazepam or N-desmethyl-diazepam was found, and therefore an enterohepatic circulation cannot be held to account for the prolonged half-life of these substances in man. 17 references. (Author abstract modified)

250657 Christensen, J. M.; Holford, S. Department of Clinical Chemistry, Bispebjerg Hospital, DK-2400 Copenhagen NV, Denmark Methaqualone in human serum and cerebrospinal fluid after oral intake. *Journal of Pharmacy and Pharmacology* (London). 27(7):538-539, 1975.

The concentration of methaqualone in human serum and cerebrospinal fluid is determined in order to elucidate the mechanism of transfer from blood to cerebrospinal fluid. On the supposition that only the unbound fraction of a drug of this type is therapeutically active, the serum protein binding of methaqualone in man was examined and the unbound fraction was compared with the concentration of methaqualone in cerebrospinal fluid. Results show that the ratio of the unbound fraction of methaqualone in serum and in cerebrospinal fluid is approximately one to one. It is suggested that the transfer from blood into cerebrospinal fluid is controlled by simple physicochemical factors and that there is no inhibition of the transfer, which depends only upon the difference in the concentration of the free fraction of methaqualone in serum and the concentration of methaqualone in the cerebrospinal fluid. 6 references.

250725 Tyrer, Stephen; Hullin, R. P.; Birch, N. J.; Goodwin, J. C. Department of Psychiatry, Charing Cross Hospital, London W6 8RF, England Absorption of lithium following administration of slow-release and conventional preparations. *Psychological Medicine* (London). 6(1):51-58, 1976.

The plasma lithium levels of 18 subjects receiving one standard and two slow release preparations of lithium carbonate were measured at frequent intervals during the 24 hours following oral ingestion of a single dose of the drug. Although the slow release tablets showed slow release in vitro, this was not so in vivo. One slow release preparation, in particular, was found to be ineffectively absorbed by some subjects. There was no difference in the rate of absorption and excretion between the other slow release product and the standard preparation. The implications of the results are discussed; it is concluded that comparative studies with approved drugs should be undertaken in human subjects in order to monitor the bioavailability of new and existing drugs and that claims

for slow and sustained release drugs generally should be greeted with greater skepticism. 23 references. (Author abstract modified)

251162 Turner, P. Department of Clinical Pharmacology, St. Bartholomew's Hospital, London, England Some studies of beta-receptor blocking drugs on the central nervous system in man. *Scottish Medical Journal* (Glasgow). 20(6):290-291, 1975.

To examine the possibility of CNS effects with beta receptor blocking drugs, test performance before and after oxprenolol and/or propranolol administration was measured under double-blind conditions. The tests included critical flicker frequency, pursuit rotor tasks, and reaction time. No CNS effects were noted in hyperthyroid patients or in normal volunteers. Later testing with normal volunteers yielded similar results. It is concluded that single doses of oxprenolol or of propranolol up to 320mg may produce changes affecting cerebral bloodflow and performance in behavior testing, but no CNS effects can be established. Even if such changes had been demonstrated, it is suggested that they could not definitely be ascribed to central drug effects.

251420 Blevins, R. D.; Regan, J. D. College of Health, Department of Health Sciences, East Tennessee State University, Box 2841, Johnson City, TN 37601 Delta-9-tetrahydrocannabinol: effect on macromolecular synthesis in human and other mammalian cells. *Archives for Toxicology* (Berlin). 35(2):127-135, 1976.

Delta-9-tetrahydrocannabinol, the principal psychoactive component of marihuana, is investigated for effects upon macromolecular synthesis in human and other mammalian cells. This compound at .00001 molar concentration in the medium of human cell cultures appeared to inhibit DNA, RNA, and protein synthesis by 50%, 40%, and 30% respectively, as measured by incorporation of radioactive precursors into acid insoluble cell fractions in human diploid fibroblasts, human neuroblastoma cells, and mouse neuroblastoma cells. While delta-9-tetrahydrocannabinol inhibited semiconservative DNA synthesis, it had no effect on DNA repair synthesis in human cells as assayed by the photolysis of 5-bromodeoxyuridine incorporation into DNA during repair after ultraviolet radiation damage. Delta-9-tetrahydrocannabinol also had no effect on rejoining of DNA single strand breaks induced by gamma rays. The nonspecificity of the inhibition of macromolecular synthesis by delta-9-tetrahydrocannabinol suggested a possible interference with uptake of radioactive precursors. However, experimentation has shown that this depression of macromolecular synthesis cannot be accounted for by reduced transport of radioactive precursors into the cell because the rate of transport of these precursors into the cell is essentially the same in the presence or absence of delta-9-tetrahydrocannabinol. Pool sizes of macromolecular precursors as measured radioisotopically (3H-thymidine, 3H-uridine, 14C-leucine) appear to be reduced about 50%, and this reduced pool size could fully account for the reduced macromolecular synthesis seen in the presence of delta-9-tetrahydrocannabinol. It is not known what causes this apparent reduction of pool sizes in the presence of delta-9-tetrahydrocannabinol. 24 references. (Author abstract modified)

251561 Chesher, G. B. Department of Pharmacology, University of Sydney, Sydney, New South Wales 2006, Australia Some pharmacological aspects of drug dependence. *Medical Journal of Australia* (Glebe). 2(23):876-877, 880-882, 1975.

The self-administration of drugs to achieve altered states of consciousness is recognized as normal human behavior. Com-

munity attitudes towards drug use vary according to the drug and often bear little relationship to the known pharmacological and toxicological effects of the drug. For an objective assessment of the potential dangers associated with drug use, a distinction is made between drug use and drug abuse. It is stressed that the progression from drug use to drug abuse involves social and psychological factors in addition to pharmacological factors. The sequential development of drug dependency is described under the headings: 1) induction; 2) continued consumption; 3) compulsive consumption; 4) withdrawal; 5) abstinence; 6) reinduction. It is contended that man uses psychotropic drugs because he finds the effects rewarding. Some experimental models to explore the neurophysiological basis of the reward are described. Experiments employing inhibitors of protein synthesis suggest that the phenomena of tolerance and physical dependence involve the synthesis of new protein. It is suggested that the new protein might be new receptor molecules for the drug or neurotransmitter substance and that these new receptors might constitute a "drug memory," providing a possible explanation for the high relapse rate of drug dependent subjects. 10 references. (Author abstract)

251830 Gardos, George; Cole, Jonathan O.; Sniffin, Celia. Institute of Research and Rehabilitation, Boston State Hospital, Boston, MA 02124 An evaluation of papaverine in tardive dyskinesia. *Journal of Clinical Pharmacology*. 16(5-6):304-310, 1976.

Evaluation of papaverine in nine hospitalized chronic patients with moderate to severe tardive dyskinesia, is discussed. Duration of orally administered papaverine varied between two and six weeks. Changes in movements were assessed on the Simpson and Abnormal Involuntary Movements scales. Results showed a 20 to 25% improvement in oral dyskinesia but only two patients showed clinically obvious improvement in movement disorders. No drug induced side effects were found. It is contended that the mechanism of pharmacologic action of papaverine in movement disorders needs to be clarified, but dopamine receptor blockade may be primarily involved. 13 references.

251937 Troupin, Allan S.; Ojemann, Linda Moretti; Halpern, Lawrence M.; Dodrill, Carl B.; Wilkus, Robert J.; Friel, Patrick. no address Carbamazepine (Tegretol) -- a double-blind comparison with phenytoin (Dilantin). *Neurology*. 26(4):342-343, 1976.

In a paper presented at the 18th annual meeting of the American Academy of Neurology, in Toronto, a controlled double-blind crossover evaluation of the anticonvulsant carbamazepine (Tegretol) was reported in which the drug was compared to phenytoin (Dilantin). Forty eight ambulatory adult outpatients with focal and/or secondary generalized seizures finished the study, which covered a 2 month accessation period (patients all on phenytoin alone) and two subsequent 4 month periods in which each patient was on phenytoin or carbamazepine alone in random order. Patients were seen monthly. EEGs and full neuropsychologic evaluations were performed at the ends of the three periods. Twenty-two patients had fewer seizures while taking carbamazepine, 21 had fewer while taking phenytoin, and 4 had an equal number on either drug. When adjustments were made for side-effects 25 patients were placed on carbamazepine at the end and 22 on phenytoin. Side-effects were rated objectively and compared. Phenytoin showed more side-effects (predominantly ataxia and nystagmus) than did carbamazepine (generally nausea and vomiting). More subtle and subjective side-effects were quite

prominent in the phenytoin periods. No patients were removed from the study because of hematologic problems. Serum and saliva drug levels were correlated with seizure control, side-effects, EEG findings, and neuropsychologic performance. (Author abstract modified)

251958 Tolosa, Eduardo S. no address **Antidopaminergic effects of apomorphine in patients with dyskinesias.** *Neurology*. 4(26):373, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, a study was conducted to clarify the mechanisms by which apomorphine lessens dyskinesias. Drugs with effects on central dopaminergic and cholinergic systems were administered to six patients in whom an antidyskinetic effect of injected apomorphine had been previously demonstrated. Physostigmine (1.0 to 2.0 mg intravenously), levodopa (4.5 to 8 gm/day, up to 10 months' duration), and haloperidol (up to tolerated dosage) were administered to these patients in separate clinical trials. In only one patient did the cholinergic agent physostigmine produce moderate antidyskinetic effect. Levodopa produced no consistent change on the dyskinesias. Haloperidol reduced the involuntary movements markedly in all patients. These studies suggest that apomorphine attenuates dyskinesias not through a cholinergic effect but through a central antidopaminergic one. The possible mechanisms by which this effect is produced include stimulation of presynaptic inhibitory dopamine receptors or antidopaminergic effect of the methylated metabolite of apomorphine. (Author abstract modified)

251960 Van Woert, Melvin H.; Rosenbaum, David; Jutkowitz, Robert. no address **Long-term therapy of neurologic disorders with L-5-hydroxytryptophan.** *Neurology*. 4(26):373-374, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology in Toronto, L-5-hydroxytryptophan (L-5HTP), the precursor of serotonin, was administered in conjunction with carbidopa to 45 patients with neurologic disorders for over 3.5 years. The most dramatic improvement was observed in 15 patients with postanoxic intention myoclonus (11 patients had 50 to 100% improvement). Since CSF 5-hydroxyindoleacetic acid (5-HIAA) was decreased in these patients, the therapeutic effect may be due to repletion of brain serotonin. L-5HTP plus carbidopa also reduced intention myoclonus due to other etiologies (familial cerebellar degeneration, methyl bromide, toxicity, head trauma, progressive myoclonus epilepsy, essential myoclonus) but had no effect on palatal myoclonus. Tics and self-mutilation in a patient with Tourette's syndrome diminished during therapy with L-5HTP and carbidopa; self-mutilation in Lesch-Nyhan's disease also responds to L-5HTP therapy. The daily dosage of L-5HTP has ranged from 400 to 2,000 mg and carbidopa from 100 to 300 mg; isocarboxazid (Marplan), a monoamine oxidase inhibitor, enhanced the therapeutic effect but pyridoxine had no effect. Initial side-effects were anorexia, nausea, and diarrhea and less common late side-effects included hypomania, dyspnea, diplopia, mydriasis, and 17% reduction of plasma cholesterol. Blood serotonin increased despite coadministration of as much as 300 mg of carbidopa per day; blood L-5HTP, serotonin, and 5-HIAA levels can be used to determine individual optimal carbidopa dosage. (Author abstract modified)

251984 Straumanis, John J., Jr.; Shagass, Charles. Eastern Pennsylvania Psychiatric Institute, Henry Avenue and Abbot Road, Philadelphia, PA 19129 **Electrophysiological effects of triiodothyronine and propranolol.** *Psychopharmacologia (Berlin)*. 46(3):283-288, 1976.

The effects of triiodothyronine (T3), T3 combined with propranolol, and propranolol alone on somatosensory evoked responses (SER) and EEG were studied in two groups each of six male volunteer subjects. The following results were obtained: 1) T3 increased SER amplitude during the first 100 ms after stimulus, 2) addition of propranolol eliminated the SER amplitude increase resulting from T3 administration, 3) neither T3 nor T3 plus propranolol significantly altered the mean level for the temporal variability of EEG amplitude and frequency, and 4) there were no significant effects of propranolol alone on SER and EEG measures. 24 references. (Author abstract)

252231 Dencker, Hans; Dencker, Sven Jonas; Green, Anders; Nagy, Adam. Department of Surgery, University of Lund, Lund, Sweden **Intestinal absorption, demethylation, and enterohepatic circulation of imipramine.** *Clinical Pharmacology and Therapeutics*. 19(5):584-586, 1976.

The intestinal absorption and metabolism of single oral doses of imipramine (ip) were studied in man by portal catheterization. The concentration of ip and the formed desipramine (dmi) was followed in blood plasma obtained from the portal and cubital veins. The absorption of ip seemed to be completed 80 min after the administration of the drug. There was no sign of demethylation of ip during the passage across the intestinal wall. Evidence was found of an enterohepatic circulation of both ip and dmi. 9 references. (Author abstract)

252327 Benowitz, Neal L.; Jones, Reese T.; Lerner, Charles B. Langley Porter Neuropsychiatric Institute, San Francisco, CA 94143 **Depression of growth hormone and cortisol response to insulin-induced hypoglycemia after prolonged oral delta-9-tetrahydrocannabinol administration in man.** *Journal of Clinical Endocrinology and Metabolism*. 42(5):938-941, 1976.

Six hospitalized volunteer male subjects were given insulin, 0.15 U/kg, before and after 14 days of administration of delta-9-tetrahydrocannabinol (THC) at a dose of 210 mg/day. A diminished maximal serum human growth hormone (GH) increase followed the prolonged THC ingestion. The mean maximal GH response was: 52.6 ng/ml plus or minus 8.7 (plus or minus SE) before THC and 18.8 ng/ml plus or minus 6.7 (plus or minus SE) during THC, p less than 0.01; corresponding cortisol responses were 20.1 micrograms/dl plus or minus 3.0 before THC and 10.0 micrograms/dl plus or minus 1.1 during THC, p less than 0.05. The data suggest suppression of the hypothalamic/pituitary axis after prolonged high dose THC. This is consistent with other reported endocrine effects of marihuana in man. 17 references. (Journal abstract modified)

252825 Lau, R. Jane; Tubergen, David G.; Barr, Mason, Jr.; Domino, Edward F.; Benowitz, N.; Jones, Reese T. Department of Pediatrics, University of Michigan, Ann Arbor, MI 48109 **Phytohemagglutinin-induced lymphocyte transformation in humans receiving delta-9-tetrahydrocannabinol.** *Science*. 192(4241):805-807, 1976.

A study was conducted to compare the phytohemagglutinin (PHA) induced blastogenesis of normal human subjects and subjects receiving a known quantity of delta-9-tetrahydrocannabinol (delta-9-THC), the major psychoactive component of marihuana, at scheduled time intervals under carefully controlled hospital conditions. Eight otherwise healthy male chronic marihuana smokers were hospitalized for a period of 30 days. Initially they received placebo, then a sustained dose of 210 milligrams of delta-9-THC per day for 18 days, followed by placebo. Lymphocyte responses to phytohemagglutinin were examined during each of these periods. Neither the daily ingestion of marihuana extract containing 210 milligrams of

delta-9-THC for 18 days nor the history of chronic marijuana smoking had a depressive effect on the lymphocyte responses of these subjects to phytohemagglutinin. 10 references. (Author abstract modified)

253137 Hokin-Neaverson, Mabel; Burckhardt, William A.; Jefferson, James W. Department of Psychiatry, University of Wisconsin, Madison, WI 53706 **Increased erythrocyte Na⁺ pump and NaK-ATPase activity during lithium therapy.** Research Communications in Chemical Pathology and Pharmacology. 14(1):117-126, 1976.

Erythrocyte Na⁺ pump activity was compared before and during lithium therapy in the same individuals to test whether there was an increase in this activity during lithium therapy. The experimental groups consisted of 20 patients who were started on lithium therapy for a variety of psychiatric conditions. A significant mean increase of 18% in erythrocyte sodium pump activity (P less than 0.01, t test) was observed during lithium treatment, as compared with the activity before lithium treatment was started. The mean level of erythrocyte membrane ouabain sensitive ATPase activity in a group of 35 subjects who were receiving lithium therapy was significantly higher than that of a different group of 38 subjects who were not receiving lithium therapy (P less than 0.005, t test). These observations may offer a biochemical mode of action for lithium in the treatment of bipolar affective syndrome, since a deficiency of sodium pump activity has been shown to be associated with that disorder. 12 references. (Author abstract modified)

253609 Benowitz, Neal L.; Jones, Reese T. Langley Porter Neuropsychiatric Institute, 401 Parnassus Ave., Room A-309, San Francisco, CA 94143 **Cardiovascular effects of prolonged delta-9-tetrahydrocannabinol ingestion.** Clinical Pharmacology and Therapeutics. 18(3):287-297, 1975.

The cardiovascular effects of prolonged delta-9-tetrahydrocannabinol (THC) ingestion were studied in male Ss between 20 and 27 years of age who had been using cannabis regularly for a mean of 4 years. In contrast to the tachycardia and unchanged or increased blood pressure seen after single doses, prolonged ingestion produced significant heart rate slowing and blood pressure lowering in these hospitalized volunteers. Impaired circulatory response to standing, exercise, Valsalva maneuver and cold pressor testing suggested a state of sympathetic insufficiency. Marked weight gain was observed and related to fluid retention and plasma volume expansion. Tolerance developed to orthostatic hypotension, possibly related to plasma volume expansion, but did not develop to the supine hypotensive effects. Nearly complete tolerance developed to the tachycardia and psychological effects produced by smoked marijuana while ingesting THC. Electrocardiographic changes were minimal despite the large cumulative THC dose. The hypothesis that THC has a biphasic effect on the sympathetic nervous system in man, producing excitation with single doses and inhibition with prolonged administration, is discussed. 28 references. (Author abstract modified)

14 MECHANISM OF ACTION: BEHAVIORAL

243087 Dalton, William S.; Martz, Robert; Lemberger, Louis; Rodda, Bruce E.; Forney, Robert B. Department of Toxicology, Indiana University School of Medicine, Indianapolis, IN 46202 **Influence of cannabidiol of delta-9-tetrahydrocannabinol effects.** Clinical Pharmacology and Therapeutics. 19(3):300-309, 1976.

The possible interaction of tetrahydrocannabinol (THC) and cannabidiol (CBD), two major components of marijuana, was investigated in double-blind experiments under controlled laboratory conditions. In one study, 15 male volunteers were given placebo or 25mg/kg of THC together with either placebo or 150mg/kg of CBD by inhalation of the smoke of a single cigarette. All four treatments were assigned to each subject according to a series of Latin square designs. CBD significantly attenuated the subjective euphoria of THC. Psychomotor impairment due to THC was not significantly altered by the simultaneous administration of CBD, but a trend indicating a decrease in THC like effects was observed after the combination. When administered alone, CBD was inactive for all the parameters measured. In a second study, eight male subjects were given CBD (0 or 150mg/kg) by smoke inhalation 30 minutes before THC (0 or 25mg/kg) in a second cigarette. In contrast to the simultaneous administration of both drugs, CBD pretreatment did not alter the effects of THC on the parameters observed. 16 references. (Author abstract modified)

243822 Mendeslon, Wallance B.; Jacobs, Laurence S.; Sitaram, N.; Wyatt, Richard J.; Gillin, J. Christian. Lab. of Clinical Psychopharmacology, SMHR, IRP, St. Elizabeth's Hospital, Washington, DC **Methscopolamine: suppression of sleep-related growth hormone secretion and dissociation from slow wave sleep.** Washington, DC, NIMH, 1976. 1 p.

To help determine if a cholinergic system is involved in regulation of sleep related growth hormone (GH), 0.5mg methscopolamine or 0.5cc saline was administered i.m. to five young men one hour before bedtime. Blood samples for GH analysis were drawn every 20 minutes during 8 hour sleep electroencephalograph recordings in a double blind paired observation study. Mean peak GH plasma levels dropped from 7.4plus or minus 1.8mg/ml on saline nights to 0.6plus or minus 0.5ng/ml on methscopolamine nights. Mean plasma levels over the night were 2.1plus or minus 0.6ng/ml and 0.6plus or minus 0.5ng/ml respectively. In contrast to the marked suppression of GH, there was no change in total sleep time, rapid eye movement (REM) latency, or in the percentage of any sleep stage. Results are in agreement with the findings of Sagales et al. who previously showed that methscopolamine did not affect human sleep. An implication of this data is that cholinergic systems may play a facilitatory role in regulation of sleep related GH secretion. As methscopolamine is not through to cross the blood brain barrier, it may be that it acts directly on the hypothalamic/pituitary axis. These data provide additional direct support that sleep related GH secretion and slow-wave sleep are dissociable. 2 references.

243953 Pirch, James H. University of Texas Medical Branch, Galveston, TX 77550 **Drugs, arousal, and brain steady potential responses.** Final Report, NIMH Grant MH-23653, 1975. 7 p.

The role of arousal mechanisms in generation of brain steady potential (SP) responses was investigated with emphasis on the effect of amphetamine and pentobarbital on cortical SP responses to a conditioned stimulus in rats. The stimulant drug, amphetamine, produced a dose related decrease in amplitude of the steady potential response. The depressant, pentobarbital, also depressed the amplitude, unexpectedly, raising the question whether their effects would be antagonistic or synergistic. Results of experiments on the interaction between the two drugs indicate an inverted U-relationship between the level of arousal and amplitude of SP response to a conditioned stimulus. A similar relationship was suggested to exist between the human contingent negative variation and arousal level. An

inverted U-function may also relate performance to arousal level in human behavior and psychiatric disorder studies. 1 reference.

244896 Schulz, Hartmut; von Cramon, Detlev; Brinkmann, Rudiger; Schony, Werner. Max-Planck-Institut für Psychiatrie, Munich, Germany /Measurement of attention deficit in the course of intoxications./ Messung des Verlaufs der Aufmerksamkeit bei intoxizierten Patienten. *Zeitschrift für Neurologie* (Berlin). 210(1):33-40, 1975.

The level and course of attention was measured hourly in 9 drug intoxicated patients after a suicide attempt over periods which varied between 12 and 72 hrs. Attention was measured by the use of two additive five step scales for susceptibility to stimulation and reactivity. Although, the original data set of attention measures was different among the patients, some common features could be elaborated: 1) the level of attention varies very little within 1 hr, and differences greater than one step on the scales were rarely observed between two measurements; 2) the mean course of recovery from attention deficit is linear throughout the scales while the variance is substantial at each step of the scales. For quantification of attention deficit a measure was defined which gives the relation between the actual deficit and full attention. Since the correlation between both scales is high over the whole observation period, it was concluded that the intoxication alters the level but not the structure of attention. 5 references. (Author abstract)

245001 Hayes, Thomas A.; Panitch, Martha Logan; Barker, Eileen. Bureau of Drugs, Food and Drug Administration, U. S. DHEW, 5600 Fishers Lane, Rockville, MD 20852 *Imipramine dosage in children: a comment on "Imipramine and electrocardiographic abnormalities in hyperactive children"*. *American Journal of Psychiatry*. 132(5):546-547, 1975.

A cautionary comment is offered concerning imipramine dosage and electrocardiographic abnormalities in hyperactive children. The Food and Drug Administration is concerned that the range of prescribed doses of imipramine for hyperactive children may have approached the range of hazardous doses. Reports indicate that heart block, convulsions, and death may occur in the absence of signs of adverse effects sufficient to indicate a need for dose reduction. Desirable dosage limitations by body weight are specified, and regular EKG monitoring is recommended when doses approach these limits. 18 references.

245012 Butter, H. J.; Lapierre, Y. D. Pierre Janet Hospital, Hull, Quebec, Canada *The effect of methylphenidate on sensory perception in varying degrees of hyperkinetic behavior*. *Diseases of the Nervous System*. 36(6):286-288, 1975.

In a double-blind study of the effect of methylphenidate, hyperkinetic children of varying ages and degree of hyperactivity were assessed on subtests of the Illinois Test of Psycholinguistic Ability (ITPA). Methylphenidate improved the scores on visual, auditory, and tactile subtests of children who showed a marked degree of hyperkinetic behavior. Improvement was also observed in the recognition of sensory stimuli presented in a monosensory fashion. Similarly, the children with a more marked degree of hyperkinesis improved their stimuli recognition rate significantly on methylphenidate when stimuli were presented to bisensory and trisensory perceptual modalities simultaneously. It is concluded that drug improvement on sensory perception seemed to be more related to the degree of hyperkinetic behavior than to chronological age. Further research of degree of hyperkinesis, age level, sensory modality, and drug administration is suggested. 6 references. (Author abstract)

245621 Barker, Philip. Charles Burns Clinic, Birmingham B13 8QD, England *Haloperidol*. *Journal of Child Psychology and Psychiatry*, etc. (Oxford). 16(2):169-172, 1975.

Studies to determine the effects of haloperidol on hyperactive children, children with tics, and children or adults who stutter are reviewed. Dosage and duration of treatment are discussed. A considerable degree of success is reported and side effects of varying severity noted. It is concluded that haloperidol is a safe drug when used properly, and can be given to most children without adverse effects, but should seldom if ever be the only treatment given. 12 references.

245648 Dalton, William S.; Martz, Robert; Lemberger, Louis; Rodda, Bruce E.; Forney, Robert B. Department of Toxicology, Indiana University School of Medicine, 1100 W. Michigan St., Indianapolis, IN 46202 *Effects of marihuana combined with secobarbital*. *Clinical Pharmacology and Therapeutics*. 18(3):298-304, 1975.

The effects of marihuana combined with secobarbital were examined in 12 male volunteers who smoked a marihuana cigarette delivering 0 or 25 micrograms/kg of tetrahydrocannabinol (THC) 50 minutes after ingesting a capsule containing either placebo or 150mg/70kg sodium secobarbital. Drugs were administered in a double-blind manner and all treatments were assigned to each S in a randomized complete block design. Objective and subjective tests measuring mental and motor performance indicated that marihuana impaired stability, hand/eye coordination, and mental performance. Secobarbital affected motor performance, manual coordination, and mental performance. In combination, marihuana and secobarbital had an additive effect on subjective responses and impairment in certain psychomotor performance tests. No interactive effect was observed. 15 references. (Author abstract modified)

245786 Garfinkel, Barry D.; Webster, Christopher D.; Sloman, Leon. University of Toronto, Hospital for Sick Children, 555 University Ave., Toronto, Ontario, Canada *Methylphenidate and caffeine in the treatment of children with minimal brain dysfunction*. *American Journal of Psychiatry*. 132(7):723-728, 1975.

A double-blind crossover test of the therapeutic efficacy of caffeine, methylphenidate, and placebo in children with minimal brain dysfunction is described. It is shown that 20mg of methylphenidate daily is significantly better than 160mg of caffeine in controlling behavior, especially impulsivity and hyperactivity, and that methylphenidate alone is superior to decaffeinated coffee and placebo. Results are considered to confirm the primary position of sympathomimetics in the pharmacotherapy of minimal brain dysfunction and to suggest the involvement of dopamine pathways in this disorder. 43 references. (Journal abstract modified)

246303 Holzman, Philip S.; Levy, Deborah L.; Uhlenhuth, Eberhard H.; Proctor, Leonard R.; Freedman, Daniel X. Dept. of Psychiatry, Univ. of Chicago, 950 East 59th Street, Chicago, IL 60637 *Smooth-pursuit eye movements, and diazepam, CPZ, and secobarbital*. *Psychopharmacologia* (Berlin). 44(2):111-115, 1975.

The effects on smooth pursuit eye tracking of single doses of chlorpromazine (CPZ) (0.667 and 1.334mg/kg), diazepam (0.071, 0.142, and 0.284mg/kg), and secobarbital (100mg) are examined in five male subjects in three clinical experiments. Results show that only the barbiturate significantly affected the ability to follow a moving target with smooth pursuit eye movements. In repeated testing of a single subject, 130mg of

secobarbital disrupted smooth pursuit movements at least until 24hrs after ingestion. 17 references. (Author abstract modified)

246315 Liljequist, R.; Linnoila, M.; Mattila, M. J.; Saario, I.; Seppala, T. Pharmacology Dept., Univ. of Helsinki, Siltaavuorenpenger 10, Helsinki 17, Finland Effect of two weeks' treatment with thioridazine, chlorpromazine, sulpiride and bromazepam, alone or in combination with alcohol, on learning and memory in man. *Psychopharmacologia* (Berlin). 44(2):205-208, 1975.

In order to determine if the adrenolytic property of psychotropic drugs has any correlation with their effects on short-term memory, low therapeutic doses of neuroleptics and a benzodiazepine generally used for the treatment of neurotic outpatients were administered to 40 paid healthy male students who participated in two subacute experiments of 6 weeks each. In the first trial 20 received bromazepam, thioridazine, and placebo double-blind cross over for 2 weeks each; in the second trial the active agents administered to the other 20 participants were chlorpromazine and sulpiride. The tests used were paired associate learning with nonsense syllables and digit memory span. Before testing the subjects took either an alcoholic or a nonalcoholic bitter drink. Results show that alcohol was found to impair learning capacity. Of the drugs used only bromazepam impaired learning significantly, and the combined effect of alcohol and bromazepam on learning capacity was very deleterious. The adrenolytic effect of drugs did not correlate with their effect on learning. It is concluded that caution is necessary when prescribing bromazepam for active outpatients at least in doses used in this study. 24 references. (Author abstract modified)

246440 Froehling, Susan; Nowlin, J. B.; Thompson, L. W. Department of Psychology, Appalachian State University, Boone, NC Effects of propranolol hydrochloride on learning in elderly Ss. *Gerontologist*. 15(5):45, 1975.

In a paper presented at the 28th annual meeting of the Gerontological Society, Louisville, Kentucky, October 1975, the effects of propranolol hydrochloride on learning in elderly subjects are discussed. Twelve elderly male volunteers performed a paired associate learning task on three successive days under the following three treatment conditions: a) propranolol administered; b) saline administered IV; c) no medication. Order of conditions and learning lists were counterbalanced. Heart rate, GSR, and FFA measures were also obtained. There were no significant differences in learning across the three conditions. Heart rate showed the expected decline during the propranolol condition. FFA levels changed in the predicted direction as a result of the drug, but the difference was not statistically significant. GSR differences were also not statistically significant across the three conditions. Results are discussed in terms of the role of arousal in age related performance decrements. (Author abstract modified)

247217 Salvendy, Gavriel; McCabe, George P., Jr. School of Industrial Engineering, Purdue University, West Lafayette, IN Marijuana and human performance. *Human Factors*. 17(3):229-235, 1975.

An investigation into the effect of marijuana on human performance is reported. Four groups of 10 subjects each, representing different levels of marijuana usage, performed two different psychomotor tasks. One group had never smoked marijuana; one group had smoked marijuana previously but had stopped. The other two groups consisted of habitual smokers of marijuana -- one smoked a placebo, and the other smoked marijuana just prior to performing the

psychomotor tasks. Consistent patterns of inferior performance were found for the marijuana users on both manipulative and coordination skills. It is concluded that marijuana negatively affects both the acquisition and initial performance of manipulative and coordination skills. 45 references. (Author abstract modified)

247379 Connors, C. Keith. University of Pittsburgh, School of Medicine, Pittsburgh, PA 15261 A placebo-crossover study of caffeine treatment of hyperkinetic children. *International Journal of Mental Health*. 4(1-2):132-143, 1975.

Eight hyperkinetic children participated in a double-blind crossover study of treatment with caffeine or a placebo in counterbalanced order. All Ss had been successfully treated with methylphenidate or dextroamphetamine and showed worsening of behavior when the stimulants were withdrawn. Only one of the Ss showed some possible clinical benefit from caffeine, and results were not generally distinguishable from those of the placebo. None of the test measures (attention, activity, level and language function) showed any consistent benefit. Reports from teachers and parents were also unpromising. It is concluded that two factors may account for the apparent failure of this stimulant in a clinical setting: 1) the dose level was fixed, and the minimal side-effects suggest that adequate dosage levels were not reached; and 2) as with other stimulants, it is possible that only certain kinds of children are responsive to caffeine. It is concluded that findings did not support the use of caffeine as a treatment for hyperkinesis, and further research is recommended. 1 reference. (Author abstract modified)

247380 Greenberg, Lawrence M.; Yellin, Absalom M.; Spring, Carl; Metcalf, Mary. Dept. of Psychiatry, Box 95 Mayo, University of Minnesota, Minneapolis, MN 55455 Clinical effects of imipramine and methylphenidate in hyperactive children. *International Journal of Mental Health*. 4(1-2):144-156, 1975.

A group of 47 hyperactive children between the ages of 6 and 13 years, who had responded well to methylphenidate, were treated with imipramine, methylphenidate, or a placebo in a double-blind crossover study. Results suggest that methylphenidate was slightly more efficacious and produced fewer severe side-effects than imipramine. Methylphenidate treatment was also associated with improved social relatedness and coordination. Imipramine appeared to exert a sedative effect. 13 references. (Author abstract)

247382 Gittleman-Klein, Rachel; Klein, Donald F. Long Island Jewish-Hillside Medical Center, Glen Oaks, NY 11004 Are behavioral and psychometric changes related in methylphenidate-treated, hyperactive children? *International Journal of Mental Health*. 4(1-2):182-198, 1975.

The relationship between behavioral and psychometric changes and methylphenidate treatment in hyperactive children is examined in a group of Ss evaluated for the efficacy of placebo, methylphenidate, thioridazine, and combined methylphenidate and thioridazine treatment. A battery of tests was administered before treatment and 4 and 12 weeks after treatment; evaluations were also obtained from patients. Results show no relationship between psychometric and behavioral improvement after 4 weeks and a weak relationship after 12 weeks of treatment. The data therefore fail to support the hypothesis that such changes occur together in hyperkinetic children treated with stimulants, and the notion that a primary, unitary CNS function is ameliorated by stimulants, leading to a remission of many secondary symptoms. Drug effects in Ss

appeared more complex, and several suggestions are offered as to possible causes of the findings, most of which are related to the methodology and measurement techniques used. 9 references.

247384 Weiss, Gabrielle. McGill University and Montreal Children's Hospital, Montreal, Quebec, Canada **The natural history of hyperactivity in childhood and treatment with stimulant medication at different ages: a summary of research findings.** *International Journal of Mental Health.* 4(1-2):213-226, 1975.

Research on hyperactivity in childhood and its treatment with stimulant drugs at different age levels is reviewed. Hyperactivity in infancy, preschool age, primary grade age, adolescence, and adulthood is considered. Observation of the literature indicates that information available on the treatment of infants is very scanty, largely based on retrospective histories given by mothers. Methylphenidate has proven very satisfactory in reducing hyperactivity in preschool children, although side-effects have been noted. Questions regarding the long-term effectiveness of drug therapy with the primary school aged children are raised, and it is observed that hyperactivity in adolescence seems to take a different form, suggested by the fact that teenagers perform poorly in competitive sports and are educationally retarded. Preliminary results of research indicate that previously hyperactive young adults adjust very well once they have left the environmental circumstances with which they could not cope. It is concluded that young adulthood offers a wider range of lifestyles, including varieties of continuing education and a wider choice of occupations. 21 references.

249124 Takahashi, Saburo; Kondo, Hisao; Yoshimura, Manabu; Ochi, Yukio. Department of Psychiatry and Neurology, Kyoto Prefectural University of Medicine, Kyoto, Japan **Thyroid function levels and thyrotropin responses to TRH administration in manic patients receiving lithium carbonate.** *Folia Psychiatrica et Neurologica Japonica (Tokyo).* 29(3):231-237, 1975.

To determine the pituitary/thyroid dysfunction in manic patients receiving lithium carbonate, determination of thyroxine concentration, T3 resin uptake, thyrotropin concentration in plasma, and thyrotropin responses to administration of thyrotropin releasing hormone (TRH), 500 micrograms i.v., were made. Eight manic patients were examined before and after lithium treatment, 600 to 1,200mg daily, for 4 weeks. Slight reduction in the plasma levels of thyroxine and slight increase in the plasma thyrotropin levels were seen following lithium treatment. Significantly enhanced thyrotropin responses to TRH administration were found as compared to the results before lithium treatment. It is assumed that lithium salts decreased both output of thyroid hormones and the sensitivity of the thyroid gland to thyrotropin, and that this action of lithium inhibiting the thyroid gland might be related to its antimanic effect. 21 references. (Author abstract)

249244 Stoller, Kenneth P.; Swanson, George D.; Bellville, J. W. Department of Anesthesiology, University of California, Los Angeles, CA 90024 **Effects on visual tracking of delta9-tetrahydrocannabinol and pentobarbital.** *Pharmacologist.* 17(2):181, 1975.

At the Fall Meeting of the American Society for Pharmacology and Experimental Therapeutics, held in August 1975 at the University of California, Davis, a study examining the effects of delta9-tetrahydrocannabinol (delta9-THC) and pentobarbital on visual tracking was presented. A critical com-

pensatory tracking task in which the dynamics of the controlled index are inherently unstable was used. The rate of divergence, λ (rad/sec), of the unstable controlled element, steadily increased as the task progressed. As the level of instability, λ , increased, control became increasingly difficult until the operator was unable to maintain control. The value at λ at which control is lost is an estimate of the subject's performance. Each of five subjects received delta9-THC 22.5mg, pentobarbital 150mg or placebo orally according to a Latin Square design. At least one week elapsed between test sessions. Sixteen trials were done prior to and every half hour for three hours after medication. The weighted mean score decreased progressively following delta9-THC and pentobarbital but not after placebo. Analysis of variance of the mean of the first 12 trials showed delta9-THC was significantly different from placebo but pentobarbital was not. (Author abstract modified)

249674 Franks, H. M.; Hagedorn, H.; Hensley, V. R.; Hensley, W. J.; Starmer, G. A. Department of Pharmacology, University of Sydney, Sydney, New South Wales 2006, Australia **The effect of caffeine on human performance, alone and in combination with ethanol.** *Psychopharmacologia (Berlin).* 45(2):177-181, 1975.

The effect of caffeine (300mg/70kg) on cognitive, perceptual and motor functions is investigated both alone and in combination with ethanol (0.75g/kg) in 68 healthy student volunteers of both sexes. A test battery consisting of standing steadiness, simple and complex reaction time, manual dexterity, numerical reasoning, perceptual speed and verbal fluency was used. Placebos for both drugs were included. Caffeine was administered in decaffeinated coffee immediately after finishing drinking the alcoholic beverage. A peak plasma ethanol concentration of 92 plus or minus 4mg/100ml occurred at 40min and was not modified by caffeine. Caffeine did not antagonize the ethanol induced decrement in performance except in the reaction time tests. Caffeine alone caused a significant increase in body sway at 40min. Social implications of this lack of antagonism patterns are briefly considered. 16 references. (Author abstract modified)

250060 Davis, Hasker P.; Spanis, Curt W.; Squire, Larry R. Department of Psychology, University of California, Berkeley, CA 94270 **Inhibition of cerebral protein synthesis: performance at different times after passive avoidance training.** *Pharmacology, Biochemistry and Behavior.* 4(1):13-16, 1976.

A study examining the possibility that the inhibition of cerebral protein synthesis may sometimes disrupt short-term memory is presented. Mice were injected subcutaneously with cycloheximide (120mg/kg) or anisomycin (150mg/kg), or bitemporally with cycloheximide or anisomycin (100 micrograms/site) and given one training trial in a passive avoidance box. Subcutaneously injected cycloheximide reduced step through latencies 10 min after training as reported previously, but anisomycin or bitemporally injected cycloheximide did not. All four drug groups exhibited impaired long-term memory. Since the results obtained at short intervals after training varied depending on the drug and route of injection, the impairment produced by subcutaneous cycloheximide at 10 min after training cannot be attributed to inhibition of cerebral protein synthesis. It is suggested that performance at short intervals after training reflects drug side-effects on step through behavior. By contrast, the impairment obtained at long intervals after training is consistent with the hypothesis that cerebral protein synthesis is required for formation of long-term memory. 18 references. (Author abstract modified)

250076 Fischman, Marian W.; Smith, Robert C.; Schuster, Charles R. Department of Psychiatry, University of Chicago, 950 East 59th Street, Chicago, IL 60637 **Effects of chlorpromazine on avoidance and escape responding in humans.** *Pharmacology, Biochemistry and Behavior.* 4(1):111-114, 1976.

The effects of chlorpromazine on shock avoidance and escape responding are reported, using four human subjects lever pressing on a modified free operant avoidance schedule. Doses of chlorpromazine ranging from 50 to 100mg and shock levels ranging from 0.35 to 3.0mA were used. In general, the results show that chlorpromazine suppresses avoidance responding at doses which do not suppress escape responding. 15 references. (Author abstract)

250193 Furtado, J. D. School of Medicine, Federal University of Rio Grande Do Sul, Sao Paulo, Brazil **Lorazepam in gastrointestinal disorders with anxiety overlay (a double-blind crossover study).** *Psychosomatics.* 17(1):32-34, 1976.

The anxiolytic effects of lorazepam against those of a placebo in a group of patients suffering from gastrointestinal disorders with anxiety overlay are investigated. A double-blind, crossover design with distribution of medication according to a randomized allocation schedule was used. A total of 23 patients (20 females and 3 males ranging in age from 16 to 67 years) all exhibiting gastrointestinal disturbances and significant anxiety were divided into two groups, each group receiving either lorazepam (1.0mg) or identical appearing placebo tablets for a period of two weeks, this treatment reversed for the next two weeks. At each visit before, during, and after treatment, patients were evaluated according to a 13 item Hamilton Anxiety Rating Scale. A steady decrease of total Hamilton scores from pretreatment levels was noted during the first two weeks of treatment while patients were receiving lorazepam. After changeover to placebo, Hamilton scores increased, approximating those of pretreatment levels. A decrease in scores was also noted in patients receiving placebo during the first two weeks of treatment, but not to the same extent; this decrease became more marked after changeover to lorazepam. These findings suggest that lorazepam diminishes the influence of anxiety which contributes to the patient's distress, is well tolerated, and is extremely useful as adjunctive treatment in both functional and organic gastrointestinal disorders in which there is a significant overlay of anxiety. 18 references.

250931 no author. no address **Hyperactivity in children.** *British Medical Journal (London).* 4(5989):123-124, 1975.

In a discussion of hyperactivity in children, it is emphasized that the causes for the behavior are complex and that treatment with amphetamines, although appropriate in some cases, should not be used exclusively. It is noted that while in the United States hyperactivity is very often diagnosed and treated with amphetamines, the hyperkinetic syndrome is much more rarely diagnosed in Britain. As a possible explanation for this discrepancy, it is proposed that hyperactivity may have social or genetic factors and management may well require a variety of diagnostic and treatment procedures, including family counseling and special schooling. It is concluded that amphetamines should only be used cautiously in treating true hyperkinesis and that social causes of hyperactivity require counseling of the patient and his family. 38 references.

251154 Zentall, Sydney S.; Zentall, Thomas R. Department of Special Education, Eastern Kentucky University, Richmond, KY 40475 **Amphetamine's paradoxical effects may be predictable.** *Journal of Learning Disabilities.* 9(3):188-189, 1976.

The contention is made that the so called paradoxical calming or depressant effects of amphetamine on both normal adults and hyperactive children can be accounted for by the proposition that amphetamines will increase arousal when the initial level of arousal is low but will decrease arousal when the initial level of arousal is high. Such a model is consistent with recent evidence that hyperactive children suffer from underarousal rather than overarousal. It is concluded that the direction of change in arousal produced by amphetamine can be predicted if the prior level of arousal on activity is known. 9 references. (Journal abstract modified)

251155 Kelly, Desmond. no address **Beta-adrenergic blocking drugs for anxiety.** *Scottish Medical Journal (Glasgow).* 20(6):279-280, 1975.

The effects of beta adrenergic blockers in treating anxiety are briefly discussed, stressing that they are valuable in cases where sedation is a disadvantage and a high level of intellectual performance is required. Since they have no euphoriant effect, the risk of abuse is nonexistent and adverse psychological reactions are uncommon. Recent research has indicated their usefulness in treating anxiety associated with testing public speaking, driving, and for diminishing the rises in adrenaline normally seen in airline passengers and mountain climbers. Use of oxyprenolol and propranolol is recommended in such cases, since more is known about their long-term and short-term effects than those of the newer preparations. 4 references.

251569 Lerer, Robert J.; Lerer, M. Pamela. 1277 Hicks Boulevard, Fairfield, OH 45014 **The effects of methylphenidate on the soft neurological signs of hyperactive children.** *Pediatrics.* 57(4):521-525, 1976.

Findings of repeat neurological examinations in hyperactive children before and after treatment with methylphenidate and placebo are reported. It is noted that the neurological examination of many hyperactive children reveals the presence of abnormal neurological signs. Of 40 hyperactive children who had three or more neurological abnormalities on an initial neurological evaluation, 29 (72.5%) showed marked improvement or complete resolution of the neurological signs following treatment with methylphenidate hydrochloride (Ritalin) for 60 days. The administration of placebo did not change appreciably the neurological status of 20 hyperactive children. Improvement in behavior, which was ascertained by the use of Connors' Abbreviated Teacher Rating Scale, did not always correspond with resolution of the abnormal neurological signs. This finding suggests that methylphenidate affects behavioral and motoric functions separately and independently. It is thought that repeat neurological assessment, looking for resolution of abnormal neurological signs, should be included as part of the followup medical examination in treated hyperactive children. Coupled with other objective and subjective test information, improvement of the neurological status is thought to provide supportive evidence of overall improvement in the hyperactive child who is receiving drug therapy. 13 references. (Author abstract modified)

251825 Stoller, Kenneth; Swanson, George D.; Bellville, J. Weldon. Department of Anesthesiology, Department of System Science, University of California, Los Angeles, CA 90032 **Effects on visual tracking of delta9-tetrahydrocannabinol and pentobarbital.** *Journal of Clinical Pharmacology.* 16(5-6):271-275, 1976.

Effects of delta9-tetrahydrocannabinol (THC) and pentobarbital on hand/eye coordination using an undivided attention

visual tracking task (critical tracking) are examined. Seven normal male subjects were required to refrain from using analgesics, tranquilizers, marihuana or ethanol for 24 hours preceding the experimental period. Medications were administered orally. Analysis of variance tracking data is reported. It is concluded that delta9-THC and pentobarbital both interfered with visual tracking performance. Of these, delta9-THC had a statistically significant effect when the first 12 responses for each subject were analyzed at each half hourly period. 12 references.

251827 Russo, Raymond M.; Gururaj, Vymutt J.; Allen, John E. Department of Pediatrics, Box 49, Downstate Medical Center, 450 Clarkson Avenue, Brooklyn, NY 11203 The effectiveness of diphenhydramine HCl in pediatric sleep disorders. *Journal of Clinical Pharmacology*. 16(5-6):284-288, 1976.

The effectiveness of diphenhydramine HCl (Benadryl) in pediatric sleep disorders was studied in fifty children in a placebo controlled, double-blind clinical trial of diphenhydramine elixir given in a dosage of 1.0mg/kg at bedtime. Sleep records measuring latency time, number of awakenings and duration of sleep were compiled by the patient's parent. A global assessment was made as to the severity of sleep disturbance and therapeutic effect of the medication and placebo. Diphenhydramine was significantly better than placebo in reducing sleep latency time and number of awakenings per night. Sleep duration was marginally increased. No essential differences were seen in other study parameters, i.e., restlessness, nightmares, and difficulty awakening. Results indicate that diphenhydramine is a safe, effective bedtime sleep aid for pediatric patients. 8 references. (Author abstract modified)

251939 Risse, Gail L.; Gazzaniga, M. S. no address Verbal retrieval of right hemisphere memories established in the absence of language. *Neurology*. 26(4):354, 1976.

In a paper presented at the 28th annual meeting of the American Academy of Neurology, in Toronto, left intracarotid injections of 75mg sodium amobarbital were administered to a group of six neurology patients immediately before regularly scheduled carotid angiography. During the brief period of anesthetization of the left hemisphere, the patient was presented with a familiar object in his left hand (right hemisphere) out of view, and allowed to palpate the object for several seconds before it was removed. When the drug effects had subsided several minutes later, the patients were unable to name the object in free recall even after considerable probing but recognized it immediately when it was displayed visually along with several irrelevant items. This deficit of verbal memory is not believed to reflect a general disturbance in recall ability since these same patients in the postdrug condition readily named objects which had been presented actually in the same manner prior to the sodium amobarbital injection. Rather, the results suggest that the verbal system of the left hemisphere does not have access to right hemisphere memories encoded during its absence. These data are consistent with the view that nonverbal engrams are not necessarily available to the verbal system and as a consequence become known to that sphere of conscious activity only if they produce an observable behavior. (Author abstract modified)

251986 Ogle, Clive W.; Turner, Paul; Markomihelakis, Harris. Department of Clinical Pharmacology, St. Bartholomew's Hospital, London, EC1A 7BE, England The effects of high doses of oxprenolol and of propranolol on pursuit rotor performance, reaction time and critical flicker frequency. *Psychopharmacologia (Berlin)*. 46(3):295-299, 1976.

The effects of oral oxprenolol (320mg) or propranolol (240 or 320mg) and of diazepam (5mg) or lorazepam (2mg) on pursuit rotor performance, reaction time and critical flicker frequency were investigated in healthy subjects in three separate studies. A 240mg dose of propranolol significantly impaired pursuit rotor performance but not 320mg of propranolol or oxprenolol. Both beta adrenoceptor blockers did not affect reaction time or critical flicker frequency. Diazepam impaired pursuit rotor performance and reaction time, but not critical flicker frequency. Lorazepam generally impaired all three parameters. The findings suggest that it is possible for beta adrenoceptor blockers to depress skeletal muscle activity without having a central effect, as shown by impairment of CNS function tests which rely also on muscle coordination but not of those relying only on central activity. These results also show that single oral doses of oxprenolol or propranolol, as high as 320mg do not have central effects, and support the belief that small anxiolytic doses of these blockers exert their actions through peripheral blockade of beta adrenoceptors. 29 references. (Author abstract)

252061 Levine, H. D.; Sice, Jean. Department of Surgical Research, Hektoen Institute, 627 S. Wood Street, Chicago, IL 60612 Effects of set, setting, and sedatives, on reaction time. *Perceptual and Motor Skills*. 42(2):403-412, 1976.

A study is reported evaluating the effects of sessions, individual characteristics, group behavior, sedative medications, and pharmacological anticipation on simple visual and auditory reaction time. A randomized block design was used. The project involved four separate small groups of five to nine healthy young adults who met four times for nine hours over four months and received four drug regimens under controlled conditions. Attitudes toward the experiment, which were mainly related to an early fear of potent drugs and late feelings of weariness, markedly affected reaction time. This effect decreased the test/retest reliability of the instrument, hence its sensitivity. Group behavior, subjective feelings attributable to the medications, and pharmacological anticipation, on the other hand, did not seem to have affected psychomotor performance. The effects of sedatives were much more marked and consistent with reaction time than with subjective responses, which primarily represented the influence of anticipation. This dissociation between objective and subjective behavior indicates that the subjects acted according to the drugs which they had taken but felt according to what they believed they had received. 18 references. (Author abstract modified)

252446 Gerevich, J.; Bolla, K.; Toth, K.; Sebo, J. Department of Neurology, Central Hospital of the Hungarian People's Army, Budapest, Hungary The effect of grandaxin on lorry drivers. *Therapia Hungarica (Budapest)*. 23(4):143-146, 1975.

The effects on concentration and alertness while driving of Grandaxin (tofizpam), a new Hungarian anxiolytic drug, are assessed. Sixty one male subjects between ages 19 and 25 were given either 50mg Grandaxin or placebo three times a day for 20 days. Driving faults were evaluating semiquantitatively by a rating scale. The concentration ability and alertness of drivers were evaluated by Bourdon's test and by counting down from 100 by sevens. Statistical evaluation of the results showed that Grandaxin beneficially influenced driving skill and increased concentration ability and alertness. 31 references. (Author abstract modified)

253381 Truijens, C. L.; Trumbo, D. A.; Wagenaar, W. A. Institute for Perception TNO, Kampweg 5, Soesterberg, Netherlands Amphetamine and barbiturate effects on two tasks per-

formed singly and in combination. *Acta Psychologica* (Amsterdam). 40(3):233,244, 1976.

An investigation of amphetamine and barbiturate effects on both the separate and simultaneous performance of two tasks, randomization and pursuit tracking, is reported. The drug conditions were arranged in a 4 X 4 Latin Square with three subjects assigned to each order. One session consisted of 33 trials of 120 sec, each followed by a 40 sec rest period. On randomization both the barbiturate and the secondary task resulted in a shift towards more repetition. Given most subjects' preference for too few repetitions, this resulted in a more random response sequence. Amphetamine had the opposite effect. Barbiturate and a secondary task both gave higher integrated error scores on the pursuit tracking; amphetamine brought about a lower score. Neither with randomization nor with the tracking was there an interaction between drug treatment and single vs dual task. On the basis of this additivity, it is concluded that the drugs and the dual task affect different mechanisms. An attempt is made to give a more precise specification of these mechanisms. 13 references. (Author abstract modified)

15 TOXICOLOGY AND SIDE EFFECTS

242863 Costa, Daniel; Simionescu, Ligia; Oprea, Maria. no address /The level of the growth hormone prolactin and insulin in the course of the acute administration of chlorpromazine (Plegomazin) in mental patients./ Valorile hormonului de crestere a prolactinei si insulinei in cursul administrarii acute a clorpromazinei (Plegomazin) la bolnavii psihici. *Neurologie, Psihiatrie, Neurochirurgie* (Bucuresti). 20(3):177-182, 1975.

The level of growth hormone, prolactin and insulin both in basal conditions and in the course of administration of determined amounts of chlorpromazine (Plegomazin) was investigated in psychiatric patients. Changes in the secretion of growth hormone, prolactin, and insulin following the administration of chlorpromazine were measured. Information for the explanation of weight gain reported in some patients on phenothiazines is provided. 10 references. (Journal abstract modified)

242947 Mendelson, Wallace B.; Goodwin, Donald W.; Hill, Shirley Y.; Reichman, John D. Lab. of Clinical Psychopharmacology, Div. of Special Mental Health Research, IRP, NIMH, St. Elizabeths Hospital, Washington, DC 20032 Interaction of alcohol and benzodiazepine hypnotics. Washington, DC, NIMH, 1976. 2 p.

The possible interaction of alcohol and benzodiazepine hypnotics was examined by determining whether alcohol modifies the duration of electroencephalograph (EEG) effects of these compounds. Forty seven young adults received 30mg flurazepam, 0.25mg triazolam, or placebo, alone or in combination with 0.8g/kg of alcohol. Using a system of EEG interpretation shown to be valid for determining drug effects under these conditions, EEG's were analyzed 16 hours after administration. There were no detectable residual effects from either drug alone or triazolam combined with alcohol. Compared to placebo, there were residual effects from flurazepam and alcohol together. Thus, as measured by EEG criteria, alcohol appears to potentiate the duration of action of this commonly used hypnotic. Metabolites of flurazepam have been reported in the literature to have a prolonged half-life (50-100 hours). Thus repeated use of the drug might lead to cumulative effects during use and residual effects after discontinuation. If alcohol even slightly potentiates these effects, the potentiation might also increase with chronic use. (Author abstract modified)

243064 Brown, T. C. K. Royal Children's Hospital, Melbourne, Australia *Overdosage -- the rise and fall of tricyclic antidepressants.* *Australian Paediatric Journal* (Victoria). 11(4):190-194, 1975.

A dramatic increase in the number of children admitted to a hospital following overdosage of tricyclic antidepressants was reported following the addition of these drugs to the general Pharmaceutical Benefit list in Australia. Most patients ingested tablets prescribed for their mothers or themselves. An alarming number of tricyclic antidepressants were prescribed for enuresis in children under 5 years old. The incidence of overdosage has declined since the introduction of safety packaging. However, steps which can be taken to reduce the consequences of these ingestions are summarized. 14 references. (Author abstract modified)

243085 Draffan, G. H.; Dollery, C. T.; Davies, D. S.; Krauer, B.; Williams, F. M.; Clare, R. A.; Trudinger, B. J.; Darling, M.; Sertel, H.; Hawkins, D. F. Inveresk Research International, Inveresk Gate, Musselburgh EH21 7UB, Scotland *Maternal and neonatal elimination of amobarbital after treatment of the mother with barbiturates during late pregnancy.* *Clinical Pharmacology and Therapeutics*. 19(3):271-275, 1976.

Plasma half-lives of amobarbital were determined in newborn children of 10 mothers who had been treated with barbiturates for hypertension in pregnancy for 6 to 42 days prior to delivery. Five mothers had received amobarbital, 200mg daily, and phenobarbital, 60 to 180mg daily. Half-lives in seven of the infants ranged from 16.6 to 49.4 hours, comparable to those previously reported in infants of mothers who had received only a single dose of amobarbital. Thus, there was no evidence of induction of amobarbital hydroxylation in these children. Two infants who had a greater than normal rise in serum bilirubin had longer half-lives (86.1 and 117.7 hours). In one infant, whose mother had membranous glomerulonephritis, plasma amobarbital concentration did not significantly change over the period of the study. 9 references. (Author abstract)

243088 Cushman, P.; Khurana, R. St. Luke's Hospital Center, 113th St. and Amsterdam Ave., New York, NY 10025 *Marijuana and T lymphocyte rosettes.* *Clinical Pharmacology and Therapeutics*. 19(3):310-317, 1976.

The effect of marijuana smoking on sheep cell rosetting properties of both early (active) and total T-lymphocytes was studied in vitro. Significantly fewer active rosettes were formed by T-cells from a population of 35 who appeared to be chronic marijuana smokers than the 34 controls. The late, or cold enhanced, rosettes formed by smokers and nonsmokers were similar, suggesting that similar numbers of rosette forming T-cells were present in the peripheral blood of smokers. These data suggest that marijuana smoking may affect the function of a subpopulation of T-lymphocytes, identified by their capacity to form early rosettes, possibly by affecting these cell membranes. 31 references. (Author abstract)

243438 Gabriel, E.; Hofmann, G.; Lenz, G.; Schuster, P. Psychiatrische Universitätsklinik, Lazarettgasse 14, A-1090 Vienna, Austria /Two cases of suicidal lithium intoxication./ *Zwei Falle von suizidaler Lithiumintoxikation.* *Wiener Medizinische Wochenschrift* (Wien). 125(37):520-522, 1975.

Two cases of attempted suicide by lithium overdose are reported. It is noted that acute lithium poisoning leads to conspicuous psychopathological exogenous reactions and consciousness disturbances. In addition, organic psychosyndromes

and episodes of delirium develop simultaneously. In both cases reported, a simple electrolytic substitution therapy followed by mild sedation was successful. The organic psychosyndromes disappeared within a few weeks, and no long-term neurological effects were observed. 19 references.

243716 Ballinger, Brian R.; Ramsay, Anna C. Royal Dundee Liff Hospital, Liff by Dundee, Scotland **Death and drug treatment in a psychiatric hospital.** *Gerontology (Basel)*. 22(3):220-226, 1976.

The relationship between death and drug treatment in a psychiatric hospital was investigated. A total of 218 deaths occurring in a psychiatric hospital during a 3 year period were reviewed, and their drug treatment was compared with that of a control group. The mean age at death was 76.3yrs and 76.6% of the patients were aged over 70 years. Seventy five percent of the patients suffered from an organic psychosis. Patients received a mean of 2.4 different drugs on the day of death and only 23.6% of the prescriptions were for psychotropic drugs. Twenty patients died suddenly and although more of these individuals had received tricyclic antidepressants and phenothiazines than their controls, these differences were not statistically significant. 9 references. (Author abstract modified)

243897 Greenan, Eileen. Glasgow College of Technology, Glasgow, Scotland **Drug therapy in child care.** *Nursing Times (London)*. 72(14):538-539, 1976.

The importance of determining prior medication received by children in properly assessing their diagnosis on admission to the hospital is discussed, citing case examples. The drug intake of 570 admissions was recorded by the research nurse at the Royal Hospital for Sick Children in Glasgow. The survey covered licit and illicit drugs, including over the counter remedies. The drug intake of the patient sample was 961 drugs, of which 717 were prescribed and 224 were self-medication. Antibiotics were the most frequently encountered drug group with simple analgesics and antihistamine compounds also in common use. Physicians and admissions personnel were aware of only 12.3% of the drugs that were taken. It is proposed that doctors who were required to assess the child's clinical state are not fully aware of the possible effects of previous drug therapy. It is concluded that there is an urgent need for a continuous parent held drug record which could be available to any doctor. Until some reliable means of continuous drug recording is available, it is imperative that those involved in childcare should be aware of the possible effects of drug therapy. 2 references.

244113 James, Raymond J.; Darken, Rachael A. 201 Wickham Terrace, Brisbane, Queensland 4000, Australia **Lithium carbonate and hypothyroidism.** *Medical Journal of Australia (Glebe)*. 1(9):266-267, 1976.

A case of hypothyroidism as a complication of lithium maintenance therapy is reported. The S was a 62-year-old woman who had a long history of manic-depressive illness and had been on outpatient lithium maintenance therapy in a dose of 750mg/day, 6 days/week. Clinicians are urged to see that patients receiving long-term lithium maintenance therapy have their thyroid gland function assessed periodically. 4 references. (Author abstract modified)

244355 Bodog, Gyula. Robert-Karoly-Korut-Krankenhaus, Psychiatrische Frauenabteilung, 1394 Budapest, XIII, Hungary **The relevance to differential diagnosis of the distribution of extrapyramidal symptoms resulting from neuroleptic therapy in**

psychiatric practice. *Die differentialdiagnostische Nutzbarkeit der Verteilung der extrapyramidalen Symptome infolge der neuroleptischen Therapie in der psychiatrischen Praxis. Psychiatrie, Neurologie und Medizinische Psychologie (Leipzig)*. 28(1):51-57, 1976.

The relevance to differential diagnosis of the distribution of extrapyramidal side-effects of neuroleptic drugs is discussed. In a sample of 100 schizophrenics and manic-depressive patients treated with neuroleptics, extrapyramidal symptoms developed primarily on one side or the other; on the right in schizophrenics and on the left in manic-depressives. This lateral difference was maintained even in different phases of the disease. It is therefore suggested that the so called haloperidol test be applied when diagnosis is particularly difficult. The laterality of extrapyramidal symptoms proved to be a reliable indicator when the diagnoses were later confirmed. 16 references. (Journal abstract modified)

244453 Manzo, L.; De Bernardi, M.; Lery N. Institut de Pharmacologie Medicale, Universite de Pavie, Italy **The interaction between drugs, alcohol and driving an automobile.** *Interaction medicaments, alcool et conduite automobile. Bulletin de Medecine Legale Urgence Medicale Centre Anti-Poisons (Lyons)*. 19(1):53-61, 1976.

The effect of combined alcohol and drug consumption on driving an automobile is discussed. Several types of interaction between the two substances are possible: pharmacodynamic interactions, in which alcohol and neurodepressants are potentiated; pharmacokinetic types of interactions; and metabolic interactions. With respect to diagnosis, the following parameters should be included: a precise history, both with respect to pathology and pharmacology; exact determination of the habitual or occasional consumption of alcoholic beverages; and identification and measurement of medications and alcohol absorbed in the blood and urine. In addition, the notion of interaction presents even greater problems concerning the possible interactions of alcohol with the chemical, toxicological and alimentary environment of the automobile driver. 24 references.

244497 Jus, A.; Pineau, R.; LaChance, R.; Pelchat, G.; Jus, K.; Pires, P.; Villeneuve, R. Department of Psychiatry, Faculty of Medicine, Laval University, Quebec 10, Quebec, Canada **Epidemiology of tardive dyskinesia: part II. Diseases of the Nervous System.** 37(5):257-261, 1976.

The prevalence of tardive dyskinesia in relation to the neuroleptic and antiparkinsonian drug treatment applied since the first hospitalization of 332 chronic schizophrenic patients was studied. It was found that the prevalence of tardive dyskinesia is significantly higher if the mean age was higher at the beginning of treatment with sedative or incisive neuroleptics, their combinations and added antiparkinsonian drugs. Age is the most important factor in the prevalence of tardive dyskinesia. The mean longer duration of "incisive" free intervals significantly decreases the prevalence of tardive dyskinesia. Other factors analyzed, especially the total amount of neuroleptics administered, the type of neuroleptics, and the mean duration of neuroleptic treatment, do not play a significant role in the prevalence of tardive dyskinesia. 19 references. (Author abstract modified)

244701 Di Mascio, Alberto; Bernardo, Diosdado L.; Greenblatt, David J.; Marder, Joseph E. 591 Morton Street, Boston, MA 02124 **A controlled trial of amantadine in drug-induced extrapyramidal disorders.** *Archives of General Psychiatry*. 33(5):599-602, 1976.

The effectiveness of amantadine and benztropine mesylate in controlling extrapyramidal symptoms (EPS) accompanying neuroleptic drug therapy was compared. In a double-blind trial, amantadine was found to be comparable in effect to benztropine mesylate, but with fewer side-effects. The potential role of amantadine may be in the treatment of patients with drug induced EPS for whom medication with anticholinergic properties is contraindicated. 22 references. (Author abstract modified)

244779 Okuma, Teruo; Ogura, Chikara; Akamatsu, Tetsuo; Kuda, Kenji; Setogawa, Tomoichi; Tamai, Akihiko; Matsuura, Hiroyuki; Kuba, Shusaku; Tsuchie, Harutaka. Department of Neuropsychiatry, School of Medicine, Tottori University, Tottori, Japan **Ophthalmological findings on neuropsychiatric patients during psychopharmacotherapy. I. Outline of the incidence of ophthalmological abnormalities.** *Clinical Psychiatry (Tokyo)*. 17(1):33-42, 1975.

Frequency of occurrence of ophthalmological disturbance of 313 mental patients who were treated with psychotropic drugs was studied. The results show that 86.9% of the patients had some ophthalmological abnormalities. More females had those abnormalities than males, but no mental illness and length of illness. Disturbances found in this sample include myopia, hyperopia, accommodation asthenia, central scotoma, corneal opacity, senile cataract, congenital cataract, and intraocular abnormalities. 12 references.

244932 Greenberg, Lawrence M.; Yellin, Absalom M. Div. of Child and Adolescent Psychiatry, Department of Psychiatry, Box 95 Mayo, University of Minnesota Hospitals, Minneapolis, MN 55455 **Blood pressure and pulse changes in hyperactive children treated with imipramine and methylphenidate.** *American Journal of Psychiatry*. 132(12):1325-1326, 1975.

The results of a portion of a double-blind crossover study that evaluated imipramine and methylphenidate in the treatment of hyperactive children are reported in terms of changes in blood pressure, pulse, and weight as a function of medication. Significant increases in systolic and diastolic blood pressure and pulse rate were found in hyperactive children treated with imipramine. Methylphenidate treated children showed significant weight loss but no significant changes in blood pressure or pulse. Caution is recommended in the use of imipramine and further study is recommended to determine short-term and long-term effects of imipramine on blood pressure. 2 references. (Journal abstract modified)

245019 Siomopoulos, V. 1601 W. Taylor St., Chicago, IL 60612 **Amphetamine psychosis: overview and a hypothesis.** *Diseases of the Nervous System*. 36(6):336-339, 1975.

The common clinical features of amphetamine psychosis are reviewed, pathogenic mechanisms proposed by various researchers are discussed, and an alternate hypothesis is proposed of psychic stimulation by inhibitory action of amphetamine released norepinephrine on brain serotonergic neurons. The lack of data on the link between pathophysiological alterations and psychopathological manifestations is noted in terms of its impact on psychopharmacological theory. 26 references.

245523 Tyber, Murray A. 1483 Danforth Ave., Toronto, Ontario M4J 1N5, Canada **The relationship between hiatus hernia and tricyclic antidepressants: a report of five cases.** *American Journal of Psychiatry*. 132(6):652-653, 1975.

Case reports and clinical results are reported for five patients who either noted an increased severity in symptoms from preexisting hiatus hernia or who developed symptoms of hiatus hernia for the first time while receiving tricyclic antidepressant medication. It is suggested that tricyclic antidepressants probably exert an anticholinergic effect on the esophageal sphincter, thus lowering pressure and allowing increased influx to occur in patients with hiatus hernia. It is recommended that tricyclic antidepressants be withdrawn from patients who are developing symptoms of esophageal reflux. 8 references.

245789 Warner, Allan M.; Wyman, Stephen M. Long Beach Veterans Administration Hospital, 5901 E. Seventh St., Long Beach, CA 90801 **Delayed severe extrapyramidal disturbance following frequent depot phenothiazine administration.** *American Journal of Psychiatry*. 132(7):743-745, 1975.

The occurrence of a severe striopallidal disorder in a schizophrenic patient one week after he received fluphenazine enanthate injections on an every other day schedule is reported. In view of the current interest in depot psychopharmaceuticals, it is recommended that careful attention be given to dosage and administration schedules and to the possibility of delayed pseudoparkinsonian symptoms; it is further concluded that frequent administration of depot phenothiazine agents to patients whose probable level of postdischarge cooperation will be poor is hazardous. It is suggested that investigators studying depot preparations continue to follow up their patients and monitor the incidence of delayed neurologic symptoms, and that emergency room physicians should be alerted to the possible side effects of such drugs. 10 references. (Journal abstract modified)

245806 Tolman, Keith G.; Jubiz, William; Sannella, Joseph J.; Madsen, Jack A.; Belsey, Richard E.; Goldsmith, Ralph S.; Freston, James W. Division of Gastroenterology, Univ. of Utah Medical Ctr., 50 N. Medical Dr., Salt Lake City, UT 84132 **Osteomalacia associated with anticonvulsant drug therapy in mentally retarded children.** *Pediatrics*. 56(1):45-51, 1975.

An epidemiologic investigation of osteomalacia in a school for retarded children revealed that 67 of the 289 severely retarded inpatients had osteomalacia as defined by hypocalcemia, hypophosphatemia, elevated serum alkaline phosphatase levels, and appropriate bone changes. Variables influencing bone mineralization showed no differences due to age, sex, physical activity, sunshine exposure or dietary intake of vitamin D between the osteomalacia and nonosteomalacia groups. However, all of the children with osteomalacia were receiving anticonvulsant medications, either phenobarbital, diphenylhydantoin, or both. The duration of the anticonvulsant therapy was considered to be the most important factor in the development of osteomalacia. Treatment of pathologic bone fractures due to demineralized bone was reported as the single most costly medical problem at the school. It is noted that while successful treatment has been accomplished with supraphysiologic doses of vitamin D, it is yet to be determined whether the oral administration of vitamin D will prevent the development of the skeletal abnormalities. 29 references. (Journal abstract modified)

245811 Committee on Drugs, American Academy of Pediatrics. P. O. Box 1034, Evanston, IL 60204 **Effects of marihuana on man.** *Pediatrics*. 56(1):134-143, 1975.

The pharmacology of marihuana, with emphasis on effects in man, is reviewed. Composition of marihuana, epidemiology, pharmacological considerations, psychological effects,

tolerance, adverse physical effects, and mutagenesis and teratogenesis are discussed. It is concluded that most claims of adverse effects attributed to marihuana cannot be well substantiated, that acute and chronic physical toxicity is rather low in man, and that use of marihuana can precipitate adverse psychologic reactions depending on host and situational factors. It is felt that there should be no criminal penalties for simple possession and use of marihuana. 49 references.

246061 American College of Neuropsychopharmacology-Food and Drug Administration Task Force. no address **Drug therapy: neurologic syndromes associated with antipsychotic drug use.** *Journal of the Maine Medical Association.* 66(10):282-285, 1975.

Current knowledge concerning tardive dyskinesia is reviewed and the syndrome contrasted with other neurologic conditions associated with antipsychotic drug use, including acute dystonic reaction, akathisia, and parkinsonism. Characteristic features, diagnosis, possible etiology, treatment, and prevention of tardive dyskinesia are discussed. To reduce the incidence of tardive dyskinesia, it is recommended that antipsychotic drugs be withdrawn in patients with chronic dyskinesia whose clinical state remains stable without such medication and that antipsychotics be withdrawn occasionally in other long-term patients.

246184 Lion, John R.; Azcarate, Carlos L.; Koepke, Hans H. Department of Psychiatry, University of Maryland, School of Medicine, Baltimore, MD **"Paradoxical rage reactions" during psychotropic medication.** *Diseases of the Nervous System.* 36(10):557-558, 1975.

Two case histories are reviewed in which rage reactions occurred after a patient was administered psychotropic drugs. Parallels emerged with regard to the phenomenology of pathological intoxication and the paradoxical rage reaction; both are considered to be explained by an interaction of drug, personality, and environment. One patient received clorazepate dipotassium, the other diazepam, and both were taking benzodiazepine agents. Recent evidence suggesting that oxazepam may be used with such potentially violent patients without adverse behavioral effects is cited. 22 references.

246187 Coleman, James H.; Hayes, Peggy E. no address **Drug induced extrapyramidal effects -- a review.** *Diseases of the Nervous System.* 36(10):591-593, 1975.

The medical literature on drug induced extrapyramidal effects is briefly reviewed and a synopsis of the etiological basis of the effects and their medical management is presented to promote a more efficacious approach to treatment. It is contended that the controversy regarding prescribing practices is widespread, and that several factors contribute to it: 1) confusion over the exact relationship of the neurological disorder to the therapeutic efficacy of antipsychotic drugs; 2) the availability of several methods of treatment of this iatrogenically induced disorder; and 3) disagreement over the most effective method of prescribing antiparkinson agents for treatment of the extrapyramidal effects. 28 references.

246273 Guignard, J. P.; Filloux, B.; Lavoie, J.; Pelet, J.; Torrado, A. Division de Nephrologie, Service de Pédiatrie, Hôpital Cantonal Universitaire, 1011 Lausanne, Switzerland **Effect of intravenous diazepam on renal function.** *Clinical Pharmacology and Therapeutics.* 18(4):401-404, 1975.

The effect of intravenous diazepam on glomerular filtration rate (inulin clearance) and effective renal plasma flow (PAH

clearance) was investigated in six children and 12 anesthetized rabbits. A transient decrease in inulin and PAH clearances was observed in six children given 4mg of diazepam intravenously, without measurable change in blood pressure. A similar renal effect was observed in anesthetized rabbits, together with a transient drop in systemic arterial pressure. Continuous infusion of diazepam (5mg/kg/hr) did not affect renal function in rabbits. It is suggested that this effect should be borne in mind when the drug is administered to patients undergoing renal clearance studies or to patients with preexistent renal insufficiency. 6 references. (Author abstract)

246296 Warnes, H. St. Mary's Hospital, 3830 Lacombe Ave., Montreal, H3T 1M5 Quebec, Canada **Drug interactions.** *Psychosomatics.* 16(2):70-72, 1975.

The increased incidence of iatrogenic drug reactions due to abnormal patient reaction to a drug or to the development of unexpected toxicity resulting from a combination of drugs is discussed, and a table of drug interactions is presented. It is suggested that to avoid drug interactions, the physician should be aware of the major interactions caused by drugs and should obtain from the patient drug exposure data including alcohol, nonprescribed medications, dietetic, vitamins and contraceptive intake. 14 references.

246699 Claveria, L. E.; Teychenne, P. F.; Calne, D. B.; Haskayne, L.; Petrie, A.; Pallis, C. A.; Lodge-Patch, I. C. Springfield Hospital, London, England **Tardive dyskinesia treated with pimozide.** *Journal of the Neurological Sciences (Amsterdam).* 24(4):393-401, 1975.

The action of pimozide in tardive dyskinesia induced by prolonged administration of phenothiazines was experimentally investigated. Improvement was recorded in 18 patients in a double-blind study of six weeks duration. Maximum tolerated dosage was 18.8mg/day. There was no deterioration in therapeutic action of pimozide during the test, and Parkinsonism and sedation were the main adverse effects. Findings support the view that tardive dyskinesia is produced by a disturbance in the balance of central transmitters such that dopaminergic transmission is increased. 16 references. (Author abstract modified)

246707 Kraiker, Hans. Malstatter Strasse 17, 66 Saarbrücken, Germany **Pentazocine dependence -- truth and fiction? Pentazocine-Abhängigkeit -- Wahrheit und Dichtung? Das öffentliche Gesundheitswesen (Stuttgart).** 37(5):272-283, 1975.

Three cases of pentazocine dependence are described, two of them leading to severe clinical courses and persistent mental changes. Both cross-tolerance and cross-dependence mechanism are examined. The extremely dramatic course of one patient admitted with a combined withdrawal syndrome could only be kept under control with droperidol (DHB). The properties of this substance are emphasized for treatment of vitally endangered delirious conditions of known or unknown origin. It is felt that DHB should be considered for comparable or possible competitive drug action on the CNS. It is noted that chemical structures of most central acting drugs and the relevant literature point to aryl-C-C-C-N sequences (or -C-C-N-C) to be involved in membrane transmission and loading; more research work is recommended in this area. 42 references. (Journal abstract modified)

246932 Herberg, Klaus-Peter. P.O. Box 119, William S. Hall Psychiatric Institute, Columbia, SC 29202 **Delayed and insidious onset of diphenylhydantoin toxicity.** *Southern Medical Journal.* 68(1):70-75, 1975.

Four case histories illustrating the difficulties in diagnosing diphenylhydantoin (DPH) toxicity and the need for early treatment are presented and discussed. An anticonvulsant prescribed for paroxysmal disorders, its toxic effects, dose related and nondose related, are judged to be potentially serious since its effects may be irreversible if not detected early. The illustrative cases were initially interpreted as psychiatric illnesses, until dizziness, nausea and vomiting, followed by a stumbling gait and truncal ataxia, indicated drug toxicity. In all four cases, truncal ataxia remained and permanent changes of cerebellar function is assumed. It is pointed out that toxic encephalopathy can occur even after years of tolerance to the drug. Diagnosis should be based on a careful family and personal history, including a list of all drugs taken, prescription or not, the clinical course, and examination. The possibility of delayed toxicity should be realized by every physician prescribing DPH, especially when daily dosage exceeds 300mg. 19 references.

247089 Tong, Theodore G.; Benowitz, Neal L.; Becker, Charles E.; Forni, Peter J.; Boerner, Udo. San Francisco General Hospital, San Francisco, CA 94110 **Phencyclidine poisoning.** *Journal of the American Medical Association.* 234(5):512-513, 1975.

Adverse reactions to the animal tranquilizer phencyclidine, in increasing use as a street drug, are illustrated in reports of two cases. Phencyclidine may produce either depression or stimulation of the CNS, depending on dosage and route of administration. Low doses produce effects resembling alcohol intoxication. At higher doses, acute dystonic reactions, nystagmus, and miosis are observed. Mental state ranges from euphoria to frank psychosis difficult to distinguish from schizophrenia. Sensory blockade can take place, in which the patient is awake but unresponsive. The two patients described displayed bizarre combinations of disorientation, hallucination, agitation, and dyskinetic motor activity. Recovery from coma is reported to occur within 24 hours, and the return of normal mental status within a week. Supportive care and reduction of sensory stimulation are the basis for management; soft restraint may be necessary. Diazepam may be given if the patient is agitated. 8 references.

247090 Liden, Craig B.; Lovejoy, Frederick H., Jr.; Costello, Catherine E. Dept. of Pediatrics, Harvard Medical School, Cambridge, MA **Phencyclidine: nine cases of poisoning.** *Journal of the American Medical Association.* 234(5):513-516, 1975.

Nine cases involving overdoses and poisoning with the commonly used animal tranquilizer phencyclidine hydrochloride (Sernylan), which has become an increasingly common drug of abuse, are reported. Neurological effects include nystagmus, diminished pain and proprioception, ataxia, and drowsiness, among others. Psychological effects include amnesia, anxiety, euphoria, body image distortion, and disordered thought processes. Gastrointestinal and renal symptoms also appear. Some deaths have been reported. Treatment is based on supportive care with phenothiazines, diphenylhydantoin sodium, and diazepam to control seizures or agitation. It is recommended that phencyclidine poisoning should be considered when a patient is seen with rapid onset of symptoms, including drowsiness or coma, nystagmus, moderately elevated blood pressure, increased deep tendon reflexes, ataxia, and anxiety with marked agitation. 19 references.

247147 Burns, R. Stanley; Lerner, Steven E.; Corrado, Robbie; James, Stuart H.; Schnoll, Sidney H. 350 Parnassus Ave., Suite 304 A, San Francisco, CA 94117 **Phencyclidine - states of**

acute intoxication and fatalities. *Western Journal of Medicine.* 123(5):345-349, 1975.

Poisoning and fatalities in humans attributed to the animal tranquilizer phencyclidine, now in increasing use as a street drug, are reviewed and the clinical features of intoxication are outlined. Its effects are characterized as highly dose dependent; three forms of acute intoxication are identified as being associated with different dosages and routes of administration. The presence of horizontal and vertical nystagmus with hypertension in a patient who is agitated or comatose are noted to be diagnostic of intoxication. Sensory isolation and administration of intravenous diazepam in the event of seizures are recommended as effective treatment in most instances; coma may last 12 hours or more, and mild restraint may be needed. Fatalities have been reported, and it is suggested that the gross ataxia, catatonic rigidity, misperception, or analgesia caused by phencyclidine may have contributed to drownings, highway fatalities, and other accidents. 11 references.

247148 Tri, Terry B.; Combs, Darrel T. Department of Medicine, Letterman Army Medical Center, San Francisco, CA 94129 **Phenothiazine induced ventricular tachycardia.** *Western Journal of Medicine.* 123(5):412-416, 1975.

Ventricular tachycardia as a side effect of large doses of phenothiazines such as chlorpromazine, thioridazine and chlorprothixen is reviewed, and a case is reported in which ventricular tachycardia related to thioridazine therapy developed in a 54-year-old woman with no history of heart disease. Typical phenothiazine electrocardiographic changes were present, including notched T-waves and prolongation of the Q-T interval; these changes and the arrhythmia resolved after thioridazine was discontinued. Nonhomogeneity in myocardial suppression, induction of catecholamine imbalance, direct myocardial toxicity, and alteration of ion distribution across the myocardial cell membrane are suggested as possible mechanisms of arrhythmogenesis. Recommended treatments include: moderate phenothiazine dosages, electrocardiographic monitoring, and antiarrhythmics, cardioversion, or a pacemaker if ventricular arrhythmia occurs. 30 references.

247359 no author. no address **Should patients receiving major tranquilizer therapy receive antiparkinson drugs prophylactically?** *Journal of the Medical Society of New Jersey.* 72(11):959-960, 1975.

The common prophylactic use of antiparkinson drugs in patients at the outset of major tranquilizer therapy is evaluated. In order to control drug induced extrapyramidal reactions, a number of synthetic antispasmodics with anticholinergic activity are commonly prescribed; although these antiparkinson agents have proved to be effective in reducing or relieving extrapyramidal reactions, it is suggested that the prophylactic use of antiparkinson agents may be unnecessary. Further, evidence indicates that antiparkinson drugs may increase the incidence of tardive dyskinesia by lowering the threshold for the appearance of these movements. It is recommended that if an antiparkinson agent is administered after the onset of appropriate symptoms, it should be discontinued after 4 to 6 weeks and the patient reevaluated. 7 references.

247377 Safer, Daniel J.; Allen, Richard P. Johns Hopkins University School of Medicine, Baltimore, MD 21205 **Side effects from long-term use of stimulants in children.** *International Journal of Mental Health.* 4(1-2):105-118, 1975.

Research data on the side-effects of long-term stimulant drug treatment on growth, cardiovascular system, and sleep in

hyperactive children are reported. Data show that: 1) dextroamphetamine and methylphenidate can adversely affect growth, and methylphenidate can produce an elevation of resting pulse during the period of drug effect; 2) dextroamphetamine, when given for more than 2 years, causes a significant suppression of weight and height gain; 3) the prolonged use of methylphenidate causes a significant degree of growth suppression only if doses exceed 20mg/day; and use of dextroamphetamine in treating hyperactivity causes no apparent changes in the cardiovascular system, in contrast to the effects of methylphenidate on resting pulse during the period of drug effects. It is hoped that data will aid the physician in his choice of which stimulant to use and the dose and the frequency of drug administration. 36 references. (Author abstract modified)

247378 Aman, M. G.; Werry, J. S. University of Auckland, Auckland, New Zealand **Methylphenidate in children: effects upon cardiorespiratory function on exertion.** *International Journal of Mental Health.* 4(1-2):119-131, 1975.

The effects of methylphenidate treatment on the cardiorespiratory function under exertion are studied in 10 hyperactive/aggressive boys given 0.3mg/kg of methylphenidate and an inert placebo in a double-blind crossover design. Heart rate (HR), respiratory rate, and work done were measured under standardized conditions of rest and under light, moderate, and heavy exercise, using a modified exercycle and postexertion rest. Compared with the placebo, methylphenidate produced increases in HR at rest that persisted during exercise but decreased somewhat at the highest exertion levels. Respiration rate was not significantly affected, although the mean rates on methylphenidate reversed to less than those on the placebo during exercise. Implications of these findings, when combined with those of other studies, suggest that: 1) methylphenidate increases HR, but this effect can be eliminated at least in part by exertion; and 2) it may cause a reduction in oxygen expenditure during exercise, possibly by vasoconstriction. 16 references. (Author abstract modified)

247544 Francois, G.; Moisan, D. Departement d'Anesthesie-Reanimation, Hopital de la Timone, 13385 Marseilles, Cedex 4, France **Antidepressant drugs and anesthesia.** *Anti-depressants et anesthesie. Encephale (Paris).* 1(3):211-217, 1975.

At the 9th Session on Psychiatric Information, held in Marseilles, March 1975, risks involved in the use of anesthetics in patients receiving antidepressant therapy were described, with particular attention given to the danger of major surgery in patients on MAOI treatment. Several anesthetic drugs commonly combined with MAOI were considered in terms of the toxicologic possibilities involved, and certain of the physiological states most susceptible to complications were described. It was contended that therapeutic accidents should be put into perspective, since only the hypertensive and not hypotensive effects of such combinations are dangerous. (Author abstract modified)

247715 Aynsley-Green, A.; Illig, R. Kinderspital Zurich, 8032 Zurich, Switzerland **Enhancement by chlorpromazine of Hyperglycemic action of diazoxide.** *Lancet (London).* 2(7936):658-659, 1975.

In a letter to the editor, the case of a 2 year old child with severe mental and psychomotor retardation, muscular hypotonia, and microcephaly who developed diabetic precoma after a single dose of chlorpromazine while receiving long-term diazoxide therapy is reported. It is known that in the treatment

of several hypoglycemic syndromes in childhood with diazoxide the effect is enhanced by simultaneous administration of thiazide diuretics, and that this combination of drugs can cause severe hypoglycemia and coma. In this case, chlorpromazine caused a similar effect. The mechanism of the action is not known, and it is speculated that it may be caused by further inhibition of insulin secretion or a more complex metabolic interaction. It is suggested that chlorpromazine should be given with caution to patients receiving long term diazoxide therapy. 10 references.

247784 Lutz, Elmar G. Department of Neuropsychiatry, St. Mary's Hospital, Passaic, NJ **Cardiotoxic effects of psychotropic drugs.** *Journal of the Medical Society of New Jersey.* 73(2):105-112, 1976.

The cardiotoxic effects of phenothiazines, tricyclic antidepressants, and lithium are discussed. Case reports are provided to illustrate the dangers involved in the use of these agents. It is warned that most drugs have multiple pharmacological effects rather than a single, precise therapeutic effect, and that this must be kept in mind, particularly when treating patients with preexisting organic heart disease. It is noted that any drug that alters repolarization of the myocardium by increasing electrical nonhomogeneity of repolarization may set the stage for arrhythmias. The need for individualization of psychotropic drug therapy and good medical supervision is emphasized. 57 references. (Author abstract modified)

247978 Greenwald, Edward S. Montefiore Hospital and Medical Center, Bronx, NY **Organic mental changes with fluorouracil therapy.** *Journal of the American Medical Association.* 235(3):248-249, 1976.

In a letter to the editor, the rapid and dramatic change in mental status of two elderly patients treated weekly with intravenous fluorouracil chemotherapy for colon cancer with liver metastases is reported. Patients were fully alert prior to the start of chemotherapy. Marked improvement of their mental capacity was indicated when the treatment stopped. It is suggested that the toxic effects of the drug were enhanced by the patient's liver metastases since the liver is the major site of fluorouracil metabolism. 4 references.

248339 no author. no address **MAO inhibitors have potential for abuse.** *Journal of the American Medical Association.* 235(4):367, 1976.

A report that Monoamine oxidase (MAO) inhibitors can induce stimulant energizing, amphetaminelike effects in some individuals and have a potential for drug abuse is presented. Dr. Shopsin, reporting on data from four patients, and using other known clinical and pharmacological findings, suggests that the MAO inhibitors and amphetamines share common properties, including: 1) the induction of euphoriant stimulating and psychotomimetic effects in certain individuals; 2) increases, albeit by different mechanisms, of the amount of functionally available neurotransmitter (catecholamines and indolamines) at the receptor site and 3) clinical association with dependence/tolerance. A case study is cited in which the use of this drug, despite high doses ingested, was accompanied by few or no untoward side effects even when taken in conjunction with other drugs and foods known to have a potential for deleterious synergism.

248850 Hollister, Leo E. Veterans Administration Hospital, Palo Alto, CA 94304 **Side effects of drugs as models of illnesses.** *Psychiatric Forum.* 5(2):1-7, 1976.

The value of drug induced side-effects as models of physical and mental illnesses is discussed. The unification of clinical observation of drug effects and pharmacological determination of the drug's action in the body is thought to be an effective method for studying the cause of certain illnesses. Examples of the method discussed include a reserpine induced model of depression, drug induced extrapyramidal motor reactions, drug induced models of schizophrenia, and tardive dyskinesia as a model for Huntington's chorea. 11 references.

248851 Fisher, Joseph V. Medical University of South Carolina, 80 Barre Street, Charleston, SC 29401 **Complications of psychoactive drugs as seen by family practitioners.** *Psychiatric Forum*. 5(2):8-23, 1976.

Complications of psychoactive drugs as seen by family practitioners are discussed. The types and frequency of emotional problems encountered by family physicians are assessed in an attempt to establish when and to what extent use of these drugs is indicated. It is postulated that overutilization increases the possibility of complications. The most frequent complications seen by 170 family physicians in a South Carolina survey are enumerated. Some remedial proposals are offered to assist the family physician in reducing the chance of complications from the use of psychoactive drugs. 6 references.

248862 Manber, Malcolm. no address **The medical effects of coffee.** *Medical World News*. 17(2):63-68, 70, 73, 1976.

Medical aspects of coffee consumption are discussed. Studies are cited which indicate that coffee has druglike effects, including habituation, traceable to the caffeine therein. Substances in coffee other than caffeine which may have druglike effects are enumerated together with the stimulant effects of caffeine. Although it is observed that no relationship between coffee drinking and bladder cancer has been established, it is noted that possible relationships to peptic ulcers, heart disease and birth defects are still being explored. Caffeinism resulting from excessive coffee consumption is related to symptoms of anxiety neurosis.

248909 Gysling, Etzel; Heisler, Seymour. Centre Hospitalier Universitaire, Sherbrooke, Quebec, Canada J1H 5N4 **A practical classification of untoward drug effects.** *Canadian Medical Association Journal* (Toronto). 113(1):32-34, 1975.

A practical classification of untoward drug effects is suggested, based on complex interactions between the drug, the patient and his condition, and additional extrinsic factors. Adverse consequences of an administered drug are said to involve adequate therapeutic dose effects, acute overdosage and cumulative effects, and chronic drug misuse. Adverse consequences related to the patient and his condition are said to concern certain characteristics of individual patients, drug antibody interactions (allergic reactions), and genetically determined abnormalities (idiosyncratic reactions). Adverse consequences related to extrinsic factors are reported to involve interactions with other drugs, dietary components, light, etc. It is felt that current methods of presenting information on untoward drug effects are inadequate and that complete understanding of the production of untoward drug effects should be linked to a detailed knowledge of the pharmacokinetic handling of a particular drug. 4 references.

249232 Bronaugh, Robert L.; McMurtry, Randolph J.; Hoehn, Margaret M.; Rutledge, Charles O. Department of Psychiatry, Neurochemistry Laboratory, New York University Medical Center, New York, NY 10016 **Conjugation of L-Dopa and its metabolites after oral and intravenous administration to Parkin-**

sonian patients. *Biochemical Pharmacology* (Oxford). 24(13-14):1317-1320, 1975.

To assess the contribution of the gastrointestinal/portal liver system to the conjugation of L-Dopa and its metabolites, tracer quantities of 3H-L-Dopa were given either orally or intravenously to patients with Parkinson's disease. The metabolism of 3H-L-Dopa was estimated by measurement of 3H-L-Dopa and some of its metabolites in urine samples collected during the first 24 hr. The decarboxylation of 3H-L-Dopa to 3H-dopamine was approximately the same when 3H-L-Dopa was given by the two routes. The subsequent metabolism of the newly formed 3H-dopamine was markedly dependent upon the route of administration. Conjugation was the major metabolic route of 3H-dopamine derived from 3H-L-Dopa given orally, while O-methylation and deamination of 3H-dopamine to 3H-homovanillic acid predominated when 3H-L-Dopa was given intravenously. In contrast to the metabolism of tracer quantities of oral 3H-L-Dopa, large oral doses of L-Dopa (3.0g/day) resulted in a smaller proportion of conjugated dopamine and a greater proportion of homovanillic acid. The conjugation of 3H-dopamine after tracer quantities of intravenous 3H-L-Dopa was only slightly decreased by the concomitant administration of 3.0g/day of oral L-Dopa. Results indicate that conjugation occurs primarily in the gastrointestinal/hepatic system after oral administration of L-Dopa; when conjugation is either suppressed by large quantities of oral L-Dopa or avoided by intravenous L-Dopa, the amounts of free dopamine as well as homovanillic acid are increased. Thus, under these conditions, more free dopamine is available to produce the peripheral side effects of L-Dopa therapy. 30 references. (Author abstract modified)

249927 Vendsborg, P. B.; Bech, P.; Rafaelsen, O. J. Department of Psychiatry, Rigshospitalet, DK-2100 Copenhagen, Denmark **Lithium treatment and weight gain.** *Acta Psychiatrica Scandinavica* (Kobenhavn). 53(2):139-147, 1976.

The problem of lithium maintenance treatment and weight gain was examined in 70 manic melancholic patients who had been in treatment for 2 to 10 years. Data were collected from a review of their case records and their responses to a questionnaire. Out of 70 patients, 45 increased in weight with a mean weight gain of about 10kg. The patients who increased in weight during the treatment were overweight before treatment and reached a weight about 20% higher than their ideal weight. Nearly all found themselves overweight and took measures to slim. No connection between a history of infant obesity and weight gain was found. Increase in appetite was found in only one third of the patients and had only a weak influence on the degree of weight gain. Nearly all the patients felt an increased thirst, and a very clear correlation between liquid intake and weight gain was found. It is recommended that all patients on lithium be repeatedly warned of the risks involved in satisfying their increased thirst with fluids rich in calories. 17 references. (Author abstract modified)

250056 Haskell, David. Boston University School of Medicine, Boston, MA 02115 **Withdrawal of diazepam.** *Journal of the American Medical Association*. 233(2):135, 1975.

In a letter to the editor, the need for further study of and caution with the drug diazepam is urged, based on the clinical experience of the author. Barbiturate type withdrawal symptoms after 4 to 6 months of diazepam therapy in doses as low as 15mg/day were experienced by several patients. The possibility of depression after prolonged diazepam treatment is also reported. It is noted that, although addiction to diazepam may develop in only a small percentage of patients, it is so abun-

dantly prescribed, that a large number of patients may be affected. 4 references.

250175 Federman, Edward J.; Yang, Raymond K. Laboratory of Developmental Psychology, National Institute of Mental Health, Building 15-K, 9000 Pike, Bethesda, MD 20014 A critique of "obstetrical pain-relieving drugs as predictors of infant behavior variability". *Child Development*. 47(1):294-296, 1976.

A critique of Aleksandrowicz and Aleksandrowicz's (1974) study which concluded that the use of obstetrical drugs is related to a considerable degree to infantile behavior over the first month of life is presented. Questions are raised as to the adequacy of a number of procedures used in the studies. Sample size, failure to consider the meaningfulness of factors with eigenvalues greater than one, and the selection of a marker variable to represent the factor are some of the objects of criticism. It is contended that these questions are serious enough to disturb the foundation for any conclusions. 8 references. (Author abstract modified)

250209 Muller, Diethard; Kruger, Erhard. Nervenlinik der Medizinischen Akademie Magdeburg, DDR-301 Magdeburg, Leipziger Strasse 44, Germany /Side-effects of lithium therapy./ Nebenwirkungen der Lithiumtherapie. *Psychiatrie Neurologie und medizinische Psychologie* (Leipzig). 27(3):172-180, 1975.

Side-effects and complications of lithium therapy are examined by evaluation of data registered from 73 patients (55 females and 18 males ranging in age from 25 years to 62 years). Sixty two patients suffered manic-depressive symptoms, five schizoaffective psychoses, and three experienced chronic endoreactive upsets. At the onset of lithium therapy approximately half of the patients experienced side-effects. The majority were transitory: exhaustion (20 patients), giddiness and vertigo (13), tremors of the hands (11), diarrhea (4), profuse perspiration (2), increased thirst (12). All transitory symptoms disappeared completely without additional therapy within 5 months; most disappeared considerably earlier. Non-transitory side-effects such as occasional development of struma and bodyweight increase require regular controls. In 11 patients a throat constriction of 1 cm to 2 cm was noted, but the patients were unaffected by this development and control was considered unnecessary. Two female patients showed allergic reactions to lithium salts evidenced by erythema; lithium therapy was terminated in these cases. Two female patients taking Melipramin experienced generalized convulsions. In one case anticonvulsive therapy was successfully administered. Melipramin was also a factor in three patients suffering extrapyramidal disturbances. 40 references.

250715 Matthew, Henry. Regional Poison Treatment Centre, Royal Infirmary, Edinburgh, Scotland **Barbiturates**. *Clinical Toxicology*. 8(5):495-513, 1975.

It is argued that the prescription of barbiturates, except as anticonvulsants, be discontinued, due to their high toxicity in overdose, the risk of dependence, and their use in 70% of suicides and drug abuse. Symptoms and treatment of barbiturate poisoning are described, advocating conservative intensive support therapy as the most important basic management concept. It is advised that every patient who has taken an overdose of a barbiturate should be seen by a psychiatrist, as it is considered highly improbable that an adult ever accidentally takes such an overdose. It is recommended the doctors should be constantly reminded of safe alternatives to barbiturates and of the seriousness of prescribing a dangerous drug with strong addictive properties. 81 references.

250722 Mindham, R. H. S.; Marsden, C. D.; Parkes, J. D. Department of Psychiatry, Mapperly Hospital, Nottingham NG3 6AA, England **Psychiatric symptoms during L-dopa therapy for Parkinson's disease and their relationship to physical disability**. *Psychological Medicine* (London). 6(1):23-33, 1976.

A study was undertaken to examine the factors influencing the effect of L-Dopa on the mood of patients with Parkinson's disease and to explore the relationship between physical disability and mental state. Fifty patients attending a neurological outpatient clinic for Parkinson's disease were assessed by standardized methods for both physical and psychiatric symptoms, and received treatment with L-Dopa, L-Dopa with carbidopa or anticholinergic drugs and/or amantadine. During the following 6 month period the patients initially showed a high psychiatric morbidity. During treatment, 22 patients developed a depressive disorder, 12 of which had a history of previous depressive episodes. By contrast, of the 11 patients who showed very few affective symptoms during followup, none had a history of depression. Of the 22 patients with a depressive disorder, only 2 were in the anticholinergic/amantadine group compared with 9 and 11 in the other groups. Findings did not support the suggestion that L-Dopa is an antidepressant drug, nor did they suggest a simple relationship between the deficiency of dopamine in the brainstem known to occur in Parkinson's disease and affective symptoms. The probable relevance of the findings of the study to the management of patients with Parkinson's disease is outlined. It is concluded that patients who have had depressive episodes before are particularly likely to develop further episodes during treatment with L-Dopa, and that this risk should be weighed against other factors when treatment with L-Dopa is under consideration. It is stressed that the use of L-Dopa in Parkinson's disease cannot be expected to correct existing depression of mood and that the presence of depression of mood does not constitute an additional indication of its use. 46 references. (Author abstract modified)

250989 Singh, Man Mohan. 1500 Waters Place, Bronx, NY 10461 **Dysphoric response to neuroleptic treatment in schizophrenia and its prognostic significance**. *Diseases of the Nervous System*. 37(4):191-196, 1976.

Data on subjective responses (unpleasant mood changes, agitation, and hostility) to neuroleptic treatment and their prognostic implications are reported from a multidimensional double-blind study of the pharmacotherapeutic process in schizophrenia. It is suggested that the occurrence of a dysphoric response in the course of neuroleptic treatment is associated with a less favorable therapeutic response and long-term prognosis. It is also suggested that the dysphoric responders, many of whom belong to the category of nuclear or poor prognosis schizophrenia, may be fundamentally different from patients who had no dysphoric response. Data gathered confirm and extend those previously reported and show that subjective responses to neuroleptic treatment may be of prognostic significance. 16 references.

250991 Jus, A.; Pineau, R.; Lachance, R.; Pelchat, G.; Jus, K.; Pires, P.; Villeneuve, R. Department of Psychiatry, Laval University, Quebec 10, Quebec, Canada **Epidemiology of tardive dyskinesia: part I. Diseases of the Nervous System**. 37(4):210-214, 1976.

An epidemiological study concerning tardive dyskinesia on a sample of 332 chronic schizophrenic patients is presented. It was determined that the age of patients at the time of assessment procedures is the most important variable; prevalence of tardive dyskinesia was significantly higher in the older popula-

tion. The significance of an insidious beginning of the illness might be considered secondary to the role of age. Other factors such as sex, type of schizophrenia, initial syndrome, present psychic state, organic syndromes, and neuroleptic induced extrapyramidal syndrome do not seem to play a role in the prevalence of tardive dyskinesia. 37 references.

251003 Brosnan, R. D.; Busby, A. M.; Holland, R. P. C. Medical Department, ICI Pharmaceuticals Division, Alderley Park, Macclesfield, Cheshire, England **Cases of overdose with viloxazine hydrochloride (Vivalan).** *Journal of International Medical Research* (Northampton). 4(2):83-85, 1976.

Twelve cases of viloxazine hydrochloride (Vivalan) overdose are reported. All patients recovered without sequelae and no ECG abnormalities were observed. Gastric lavage was performed in most cases and was probably beneficial. As viloxazine is rapidly absorbed lavage should be carried out as soon as possible after the tablets are taken. Since the drug is almost exclusively excreted in the urine, it is suggested that forced diuresis be carried out to reduce blood levels as quickly as possible. 10 references. (Author abstract)

251417 Muller-Oerlinghausen, B.; Albrecht, J. Department of Psychiatry, Free University of Berlin, 1 Berlin 19, Nussbaumallee 36, Germany **On the clinical relevance of the intra-cellular RBC lithium concentration.** *Naunyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 293(Suppl.):R61, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 23 through 26, 1976, a study on the clinical relevance of the intracellular RBC lithium concentration is reported. It has been claimed that the determination of the RBC lithium concentration (LiRBC) represents a more reliable measurement of the lithium concentration in the brain than does the determination of lithium in plasma (LiPI). In 24 patients of a lithium clinic (29 females and 5 males) aged between 26 and 68, the lithium and potassium concentration in plasma and RBC were determined under steady state conditions during 15 months of clinical observation. Average frequency of checkups was 9 per patient. Psychopathological state and side-effects were recorded by means of the AMP system. The intracellular/extracellular lithium concentration ratio (LiQ) was 0.34. The linear regression of LiPI on LiRBC yielded $r = 0.86$. The mean dosage (D) was found to be 0.40 mval/kg. There was no significant correlation between D and LiRBC ($r = 0.17$). The intraindividual variability of LiRBC and LiQ comprised a wide spectrum within one decade (5.2 to 53.2% and 8.0 to 44.6% respectively). Patients under 50 years old showed the same absolute values of LiBBC and LiQ as the older ones, but required a 50% higher average dosage. Some evidence was found in favor of a correlation between LiQ or KQ and the frequency of relapses. Frequency and intensity of side-effects as e.g. tremor or thirst correlated well with LiRBC ($r = 0.649$) and less with LiQ ($r = 0.304$). It is concluded that LiRBC concentrations of more than 0.40 to 0.60 mM are nearly always connected with the occurrence of side-effects. (Author abstract modified)

251431 Lapiere, Y. D. Pierre Janet Hospital, 20 Pharand Street, Hull, PQ J9A 1K7, Canada **Control of lithium tremor with propranolol.** *Canadian Medical Association Journal* (Toronto). 114(7):619-620, 1976.

Lithium tremor, a side-effect of therapy with lithium carbonate, is discussed. Lithium tremor is an irregular, nonrhythmic tremor of the distal extremities, variable in both intensity and frequency. It is clinically differentiated from essen-

tial tremor and tremors due to anxiety and neuroleptics. The pathophysiologic mechanisms are hypothesized to be of peripheral origin. Five case reports of patients who were successfully treated with propranolol are presented. In general, it is noted that the dosage of propranolol must be individually adjusted and is usually from 30 to 40mg daily in divided doses. This blocker of beta-adrenergic receptors is said to remain effective with long-term administration; increases in dosage are said not to be required. 3 references. (Author abstract modified)

251654 Chahub, Elias, G.; Devivo, Darryl C.; Volpe, Joseph J. St. Louis Children's Hospital, 500 S. Kingshighway, St. Louis, MO 63110 **Phenytoin-induced dystonia and choreoathetosis in two retarded epileptic children.** *Neurology*. 26(5):494-498, 1976.

Two case histories are presented of children who exhibited long standing acquired encephalopathy subsequent to a diphtheria-pertussis-tetanus immunization and in whom dystonia and choreoathetosis developed while they were receiving phenytoin. In both cases, the baseline abnormalities on the electroencephalogram remained unchanged during the choreoathetosis, and recognizable metabolic abnormalities known to be associated with similar movement disorders were excluded. The movement disorders occurred when serum phenytoin concentrations were in the therapeutic range. These observations and the possible mechanisms by which phenytoin may precipitate involuntary movement disorders are discussed. 22 references. (Author abstract modified)

251712 Brown, W. T. University of British Columbia, Vancouver, British Columbia, Canada **Side effects of lithium therapy and their treatment.** *Canadian Psychiatric Association Journal* (Ottawa). 21(1):13-21, 1976.

Side-effects of lithium therapy and their treatment are discussed. Somatic side-effects are classified into three groups: innocuous side-effects; imminent toxicity; and toxicity. Specific side-effects discussed include: hypothyroidism, goitre, weight gain, edema, hand tremor, polyuria, and polydipsia. Ways to minimize these side-effects are presented. It is concluded that Li(+) salts are efficacious in the treatment of the manic phase of manic-depressive reactions, and that they act prophylactically against depressive and manic relapses and also against recurrent endogenous depression. It is felt that the prevention of lithium toxicity is the best recognized method of treating this potentially lethal condition. 23 references.

251754 Ellinwood, Everett H., Jr. Behavioral Neuropsycharmacology Section, Duke University Medical Center, Durham, NC 27706 **Treatment of reactions to amphetamine-type stimulants.** *Current Psychiatric Therapies*. 15:163-169, 1975.

Adverse reactions to amphetamine type stimulants and their treatment are discussed. The most serious complication of acute amphetamine overdose is hyperthermia and convulsions that precede cardiovascular collapse; emergency medical procedures and medication (primarily valium) are commonly used to prevent mortality and deal with secondary complications. In cases of acute amphetamine psychosis, a distinct syndrome appears which is characterized by delusions, ideas of reference, hallucinations, change in body image, hyperactivity and excitation, and inpatient treatment involves keeping the patient quiet and reassured and administration of haloperidol for psychotic symptoms. Antidepressants are effective in dealing with amphetamine withdrawal stages and can be begun while the patient is receiving the initial haloperidol therapy; the physician should also prepare at this time for subsequent

treatment of the underlying personality disturbance that led to such selfdestructive behavior. 18 references.

251826 Marini, James L.; Sheard, Michael H. Department of Psychiatry, Yale University School of Medicine, New Haven, CT 06520 Sustained-release lithium carbonate in a double-blind study: serum lithium levels, side effects, and placebo response. *Journal of Clinical Pharmacology*. 16(5-6):276-283, 1976.

The utility and side-effects sustained released lithium carbonate (Priadel) in a once per day dose regimen was investigated with 66 male delinquents ages 17 to 24 years, in a double-blind study comparing the antiaggressive effects of lithium carbonate with placebo. Serum lithium levels were determined weekly for up to eight drug free and twelve on medication weeks. Principal side-effects were polyuria and shakiness, with other important side-effects being: hand tremor, dryness of mouth, nausea and weakness. No lithium toxicity was observed and diarrhea was reported infrequently. 16 references. (Author abstract modified)

252656 Greenblatt, David J.; Allen, Marcia D.; Koch-Weser, Jan; Shader, Richard I. Clinical Pharmacology Unit, Massachusetts General Hospital, Boston, MA 02114 Accidental poisoning with psychotropic drugs in children. *American Journal of Diseases of Children*. 130(5):507-511, 1976.

Seventy seven (0.24%) of 32,005 admissions to the Massachusetts General Hospital pediatric service during the period 1962 to 1973 were due to accidental poisoning. In 27 cases, mostly involving children less than 6 years of age, psychotropic drugs were implicated. These included sedative/hypnotics in six cases, phenytoin in two, major tranquilizers in five, antidepressants in three, stimulants or hallucinogens in three, and drug mixtures in eight. Toxicologic analyses contributed little to diagnosis and initial management. Except for one child who ingested ferrous sulfate, no patient was seriously intoxicated, and all recovered rapidly without sequelae. Although referral of serious poisoning cases to another hospital may have biased the results, the findings suggest that accidental psychotropic drug poisoning is not a major source of childhood morbidity. 36 references. (Journal abstract)

252733 Goldfrank, Lewis; Kirstein, Robert. Albert Einstein College of Medicine, New York, NY /Management of patients with suspected drug induced psychoses./ Stop the noises× Hospital Physician. 12(5):22-25, 1976.

Problems in dealing with amphetamine overdose in a delirious, agitated and paranoid young woman admitted to a hospital emergency room are examined. Deposited at the hospital by friends, the patient was exceedingly hyperactive and could not give the necessary information for a case history; serum analyses were not readily available. It is contended that a differential diagnosis of acute psychosis, delirium, and/or extreme anxiety must be made in such cases, together with a decision on the probable cause and best treatment approach. Procedures for achieving these goals are outlined, together with the problems commonly noted in addicts who are often involved in high dosage polydrug use. 10 references.

253034 Itoh, Hitoshi; Miura, Sadanori; Yagi, Gohei. Department of Neuropsychiatry, School of Medicine, Keio University, Tokyo, Japan A method for explaining dyskinesic movements -- a film presentation. *Psychopharmacology Bulletin*. 12(2):3-4, 1976.

The use of the Abnormal Involuntary Movement Scale (AIMS) as a standard assessment instrument of the abnormal

involuntary movements or tardive dyskinesia of neuroleptics is the subject of a presentation given at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. In order to see if the AIMS would permit standardization of observations of cross-cultural or cross nation studies on psychotropic drug effects, the AIMS was translated into Japanese by investigators and used to rate observations of movie recorded dyskinesic movements. It is reported that although the AIMS was designed to record almost all types of abnormal movements, abnormal movements resembling disturbance of respiratory rhythm, repetitive side-to-side weight shifting movements of the trunk, so-called "balancement" and akathisia that occur concomitantly with tardive dyskinesias would be difficult to record on the AIMS. It is suggested that the AIMS be modified to include chewing, weight shifting, and the particular grimace of schizophrenia. Further video recording of movements to minimize interrater differences is suggested. It is concluded that the AIMS is a well designed rating scale that can be useful for promoting cross-cultural work of persistent dyskinesia. 10 references.

253036 Alpert, Murray; Diamond, Florence; Friedhoff, Arnold J. Department of Psychiatry, New York, University Medical Center, Millhouser Laboratories, New York, NY Tremorographic studies in tardive dyskinesia. *Psychopharmacology Bulletin*. 12(2):5-7, 1976.

Tremorographic studies of the pattern of extrapyramidal system (EPS) changes produced by neuroleptics are discussed in a paper presented at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. It is shown that while increased amplitude of finger displacement is the most striking feature of pathological tremors, spectral characteristics also change as do other aspects of the waveform such as regularity, periodicity of amplitude, harmonic waves, spindle formation and abrupt changes in regularity. Using tremography to study the syndromes that follow withdrawal from neuroleptics, several experiments with physostigmine show prompt patient response including almost normal tremor patterns. The response of a patient with a buccolingual syndrome and a marked akathisia to a course of L-dopa is presented. L-dopa treatment was elected to test the hypothesis that if supersensitivity of dopamine receptors were responsible for the tardive process, supersensitivity would be reduced by discontinuance of the treatment. This was confirmed. It is concluded that tremography offers promise as an objective, quantitative, noninvasive method for measurement of EPS function and that results of the pharmacologic experiments suggest that it is not simply dopamine receptor supersensitivity but that there are some more complex relations between dopaminergic and cholinergic mechanisms that must be considered in the tardive process. 4 references.

253037 Gardos, George; Sokol, Michael; Cole, Jonathan O.; Sniffin, Celia. Institute of Research and Rehabilitation, Boston State Hospital, Boston, MA Eye color and tardive dyskinesia. *Psychopharmacology Bulletin*. 12(2):7, 1976.

The association between blue eye color in males and oral facial dyskinesia is discussed in a paper presented at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. The eye color of 132 Caucasian chronic state hospital inpatients was

determined by the consensus of three raters. Dyskinetic movements of the patients were rated by the Simpson Tardive Dyskinesia Rating Scale. No relationship was found between total dyskinesia scores and eye color. Likewise, no association is apparent between eye color and oral facial dyskinesia scores in male patients. 2 references.

253038 Goldman, Douglas. University of Cincinnati, Cincinnati, OH 45221 **Treatment of phenothiazine-induced dyskinesia.** *Psychopharmacology Bulletin*. 12(2):7-10, 1976.

A brief review of clinical observations on treatment of phenothiazine induced dyskinesia is presented. Marked improvement of dyskinetic symptoms was observed in patients treated with the unmarketed drugs SKF-9062 and W-1645. Since yohimbine, from which W-1645 is derived, produces interferences with the storage or release of serotonin, cyproheptadine (Periactin); an antihistamine known to have serotonin "antagonism" was also tried in dyskinetic patients. Treatment with cyproheptadine was found to eliminate dyskinetic symptoms. 3 references.

253041 McNutt, Barbara; Ballard, Joyce E.; Boileau, Richard. Institute for Child Behavior and Development, University of Illinois, Urbana, IL 61801 **The effects of long-term stimulant medication on growth and body composition of hyperactive children.** *Psychopharmacology Bulletin*. 12(2):13-15, 1976.

The effects of long-term stimulant medication on growth and body composition of hyperactive children are discussed in a paper at the Annual Meeting of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. Growth and body composition changes of 26 hyperactive children and 23 normal controls matched for age were compared for 1 year. Growth measurements included standing height and body weight. Body composition measurements included skinfold, muscle girths and skeletal widths. Multivariate and univariate analyses of variance performed on the body composition measures showed no significant differences between the groups or a significant growth by time interaction. It is concluded that hyperactive children both on and off medication grew the same and tended to experience similar changes in body composition. Hyperactive children being treated with methylphenidate experienced the same amount of growth as did the normal children although their body composition characteristics were different. 5 references.

253154 Clyne, Kurt E.; Juhl, Randy P. Veterans Administration Hospital, Iowa City, IA **Tardive Dyskinesia.** *Journal of the Maine Medical Association*. 67(5):129-134, 1976.

Treatment of tardive dyskinesia (TD), a neurologic disorder which can occur as a result of antipsychotic drug administration, is discussed. The disease's clinical description, etiology and pharmacology are revealed. Dopamine depleting or blocking drugs and cholinergic stimulating drugs are indicated to restore equilibrium in this syndrome. Other treatment measures and drugs which have shown some positive response in alleviating symptoms are disclosed. Four preventive measures which can be taken to minimize the occurrence of TD are presented. It is concluded that extended studies using reliable objective methods of assessment are necessary to confirm or disprove the effectiveness of those drugs used to treat TD and that until an effective mode of therapy is found, rational use of antipsychotic drugs to prevent the occurrence of TD should be incorporated into each practitioner's prescribing habits. 41 references. (Journal abstract modified)

253391 Thornton, William E. Department of Psychiatry, Abraham Lincoln School of Medicine, University of Illinois, P. O. Box 6998, Chicago, IL 60680 **Dementia induced by methyldopa with haloperidol.** *New England Journal of Medicine*. 294(22):1222, 1976.

Two cases reported in which patients receiving methyldopa at a constant dosage for over one year were observed to have a dementia syndrome within one week after haloperidol was added to the methyldopa. In each case haloperidol was discontinued and the mental symptoms disappeared. The increasing use of methyldopa and haloperidol suggests that similar unwanted interactions may be occurring and are either not being recognized or reported. It is concluded that patients using both agents require careful evaluation. 11 references.

253495 Greenblatt, David J.; Smith, Thomas W. Clinical Pharmacology Unit, Massachusetts General Hospital, Boston, MA 02114 **Digitalis: clinical implications of new facts about an old drug.** *Postgraduate Medicine*. 59(5):134-139, 1976.

Recent clinical findings are reported which suggest careful scrutiny of the appropriateness of digitalis therapy in a number of disease states and as a long-term therapy. Risk/benefit analysis indicates that the drug's value may be questionable for many conditions and in long-term therapy, and that it is probably overprescribed. The value of computerized guidance in determining proper dosage is assessed. It is suggested that the need for continuing digitalis therapy be periodically reassessed. A review of the literature on digitalis toxicity, with particular reference to the digitalis glycoside digoxin, indicates a variety of important neurological, psychiatric and visual side-effects which can be mistaken for underlying symptoms of the disease or the effect of another drug. Experimental evidence is cited suggesting that gastrointestinal manifestations of digitalis toxicity are due to CNS activity and that the drug's CNS actions may play an important part in facilitating or triggering cardiac rhythm disturbances. It is concluded that further research and frequent and meticulous observations of individual patients will increase the safety and effectiveness of digitalis use. 32 references.

253531 Marriott, Peter F. Royal Park Psychiatric Hospital, Parkville, Victoria 3052, Australia **Methaqualone with psychotropic drugs: adverse interaction.** *Medical Journal of Australia (Glebe)*. 1(12):412, 1976.

In a letter to the editor, a case history is presented in which a drug combination of methaqualone, fluphenazine, and nortriptyline led to an episode of nose bleeding and disturbance of menstruation. A 19 year old schizophrenic female presented to a fluphenazine clinic. Schizophrenic features improved with treatment, however depression remained for which nortriptyline was given. After eight days, insomnia was noted and methaqualone was prescribed. A moderately severe nose bleed occurred the following day and methaqualone was discontinued. Followup showed a menstrual disturbance. Noting that 2000 patients receive fluphenazine in Australian psychiatric hospitals and that insomnia and depression are common in chronic schizophrenics, it is stressed that physicians should be aware of the potential drug interaction with methaqualone. 3 references.

253661 Swett, Chester, Jr. Boston Collaborative Drug Surveillance Program, 400 Totten Pond Rd., Waltham, MA 02154 **Outpatient phenothiazine use and bone marrow depression: a report from the drug epidemiology unit and the Boston collaborative drug surveillance program.** *Archives of General Psychiatry*. 32(11):1416-1418, 1975.

Phenothiazine induced bone marrow depression (BMD) is evaluated in three separate but complementary data bases. Results show that 1) among 1,048 patients admitted to psychiatric hospitals, there was no evidence of subclinical depression of the white blood cell count attributable to phenothiazines used before admission; 2) among 18,587 medical inpatients, there were 34 patients admitted for BMD in the absence of neoplasia or prior cytotoxic drug therapy, one of the latter reported using chlorpromazine hydrochloride, but it is considered doubtful whether this drug was the cause of the BMD; and 3) among 24,795 medical, surgical, and gynecological patients surveyed over a 10 month period in 1972, there were four who were admitted for BMD; one of the latter had a reversible leukopenia attributed to trifluoperazine hydrochloride. 8 references. (Journal abstract modified)

16 METHODS DEVELOPMENT

248543 Levi, Refael N.; Waxman, Samuel. Departments of Psychiatry and Medicine, Mount Sinai School of Medicine of the City University of New York, New York, NY 10029 **Schizophrenia, epilepsy, cancer, methionine, and folate metabolism: pathogenesis of schizophrenia.** *Lancet* (London). 2(7923):11-13, 1975.

Seemingly unrelated observations that folate responsive schizophrenic type syndromes develop in some epileptics treated with anticonvulsant drugs, that a low incidence of carcinoma exists in schizophrenics, and that growth of malignant tissues in vitro requires methionine were used to develop a hypothesis of the pathogenesis of schizophrenia. Clinical, statistical, and laboratory findings imply the existence of a common denominator, a deficiency of methionine adenosyltransferase or its cofactors. It is contended that if this hypothesis concerning the absence or functional imitation of methionine adenosyltransferase in schizophrenics is valid, replacement therapy with pharmacological amounts of same could be an effective treatment. 27 references.

249536 Rogers, S. C.; Clay, P. M. Hospital of St. Cross, Rugby, England **A statistical review of controlled trials of imipramine and placebo in the treatment of depressive illnesses.** *British Journal of Psychiatry* (London). 127:599-603, 1975.

A method of reviewing a series of clinical trials by extracting the basic data in the form of 2x2 tables and analysing these by Fisher's two-tailed Exact Test is described, and illustrated by publishing imipramine/placebo trials. Two of the three trials of imipramine in neurotic depression gave results showing significant improvement. Results suggest that the benefit of this drug in patients with endogenous depression who have not become institutionalized is indisputable, and that further drug/placebo trials in this condition are not justified. Possible explanations of the apparent failure of this drug in groups of patients with undifferentiated depression are discussed. 41 references. (Author abstract)

249537 Gomez, Joan; Dally, Peter. Department of Psychiatry, Westminster Hospital, London, S. W. 1, England **Intravenous tranquilization with ECT.** *British Journal of Psychiatry* (London). 127:604-608, 1975.

Effects of intravenous tranquilization with diazepam and haloperidol prior to electroconvulsive therapy (ECT) are investigated. Forty depressed inpatients for whom electroconvulsive therapy had been prescribed were rated before treatment on depression and anxiety scales. Side-effects, postoperative agitation and retrograde memory impairment were assessed in each patient after each of several treatments. Results when no

tranquilizer was given and when either diazepam or haloperidol was administered intravenously immediately before the anesthetic were compared. It was found that when ECT was given without tranquilization, the incidence and severity of postoperative agitation and of side-effects were significantly greater in those patients with a high level of anxiety before treatment. Both diazepam and haloperidol were found to be effective in subduing agitation and side-effects in anxious, depressed patients, but with diazepam recovery time was longer. It is concluded that while treatment with either of the two tranquilizers is beneficial, haloperidol is preferable because it does not noticeably prolong the recovery period. It is noted that neither tranquilizer appears to diminish the effectiveness of ECT in lifting depression. 11 references. (Author abstract modified)

251776 Dinovo, Eugene C.; Gottschalk, Louis A.; Nandi, Bina Rani; Geddes, Peter G. University of California, Irvine, CA 92664 **GLC analysis of thioridazine, mesoridazine and their metabolites.** *Journal of Pharmaceutical Sciences*. 65(5):667-669, 1976.

A GLC method for measuring thioridazine, mesoridazine, their metabolites, and possibly other phenothiazines is reported. By using this method, seven different phenothiazine derivatives, thioridazine, and six known thioridazine metabolites were extracted and separated. The method was tested by assaying plasma samples from 30 hospitalized psychiatric patients receiving thioridazine or mesoridazine. 6 references. (Author abstract)

251778 Kaul, Pushkar N.; Whitfield, Lloyd R.; Clark, Mervin L. 625 Elm Avenue, Norman, OK 73069 **Chlorpromazine metabolism VIII: blood levels of chlorpromazine and its sulfoxide in schizophrenic patients.** *Journal of Pharmaceutical Sciences*. 65(5):694-697, 1976.

A procedure was standardized for extracting chlorpromazine and its sulfoxide from the blood and for applying a recently developed fluorometric assay method to determine blood levels of these two compounds in schizophrenic patients receiving chlorpromazine therapy. It is felt that the described methodology opens avenues for performing bioavailability and generic equivalence studies in humans. 12 references. (Author abstract)

251824 Moore, James D.; Weissman, Lester. University of Montana Foundation, Deer Lodge Research Unit, Deer Lodge, MT 59722 **Effect of flurazepam on common clinical laboratory tests.** *Journal of Clinical Pharmacology*. 16(5-6):241-244, 1976.

The effect of flurazepam compared to placebo on 22 common laboratory tests administered for one week on 15 normal male subjects is studied. Laboratory testing methods and statistical methods are discussed. Results suggest that for biochemical parameters the mean change from predrug baseline values for flurazepam was not significantly different from the mean change with placebo. It is concluded that flurazepam showed no apparent chemical interference on any of the testing procedures. 8 references.

253043 Fisher, Seymour. Psychopharmacology Laboratory, Boston University School of Medicine, Boston, MA 02215 **Measurement of anxiety in outpatient trials: detection of bias in patient and doctor ratings.** *Psychopharmacology Bulletin*. 12(2):17-18, 1976.

A method for detecting bias in patient doctor ratings of drug efficacy is discussed in a paper presented at the Annual Meet-

ing of the Early Clinical Drug Evaluation Units, Psychopharmacology Research Branch, National Institute of Mental Health in May 1975 in Key Biscayne, Florida. It is contended that the drug placebo test for comparing the validity of rating schedules is accurate only if: 1) the drug is effective in the population studied under the specific conditions of the trial; and 2) the double-blind remains intact and all biases that might change the meaning of the measure have been prevented from operating. Because a variety of side-effects can influence efficacy ratings in anxiolytic trials, the rating of the drug may be distorted. As an example, a double-blind experiment is reported in which the known side-effect of the drug may be distorted. As an example, a double-blind experiment is reported in which the known side-effect of the drug is correlated with improvement in the doctors' evaluation but not the patient's. In addition, two separate methodologically oriented clinical studies are reported in which there were no external pressures to demonstrate improvement and in which the side-effect and improvement are not correlated. It is contended that these data illustrate an instance in which (by the proposed method of detecting bias) both doctor and patient ratings pass the test.

17 MISCELLANEOUS

242751 Busch, H. Psychiatrische Klinik, Freien Universitat, Nussbaumallee 36, 1 Berlin 19, Germany /Psychiatric emergency caused by acute intoxication and detoxification syndromes./ Der psychiatrische Notfall durch akute Intoxikations- und Entzugssyndrome. Therapie der Gegenwart (Munchen). 114(10):1604-1630, 1976.

Causes and treatment of acute intoxication and detoxification reactions are discussed. Intoxication syndromes are attributed to psychophysical and neurovegetative changes characterized by disturbances of consciousness, cognition and behavior. Detoxification reactions are the result of somatic changes caused by withdrawal from an addiction drug. Various forms of drug induced intoxication are differentiated, and the stages and effects of acute alcohol intoxication and detoxification are discussed. The psychopharmaceutical therapy of such conditions is examined, especially the treatment of disturbances of extrapyramidal motor functions. 35 references.

242861 Korff, F. A. Haus Heidberg, 2073 Lutjensee, Germany /On sleep./ Über den Schlaf. Praktische Psychologie (Lutjensee). 29(5):159-170, 1975.

The physiological need for sleep and the effects of sleep deprivation are examined. It is suggested that up to two thirds of European adults suffer from some form of sleep disturbance. It is observed that the need for sleep in normal adults varies between 5 and 10 hours per day. Methods of autogenic training are suggested for the therapy of sleep disturbances, and the indiscriminate use of sedatives and hypnotics is discouraged.

243024 Post, Robert M. 3-West Clinical Research Unit, Section on Psychobiology, Adult Psychiatry Branch, NIMH, Bethesda, MD 20014 Clinical aspects of cocaine: assessment of acute and chronic effects in animals and man. (Unpublished paper) Bethesda, MD, NIMH, 1976. 32 p.

Several different clinical effects of cocaine are considered as they relate to both the dose and the duration of cocaine administration. Particular attention is paid to the evolution of cocaine effects with chronic administration and to the evidence that many parameters demonstrate sensitization or reverse tolerance following repeated doses. Studies of chronic cocaine in animals are reviewed in an attempt to elucidate mechanisms involved in the progressive effects of cocaine and as they relate to models for the development of psychotic behavior. 66 references.

243092 Hara, Toshio. Dept. of Psychiatry and Neurology, Kitazato University School of Medicine, Japan Treatment of patients with mental disorder. Kokoro to Shakai (Tokyo). 6(1):67-77, 1975.

Diagnosis and treatment of psychiatric disorders in students are discussed, noting that diagnosis is the first step in any treatment. Three major treatment regimes are delineated and described. Drug treatment, which began in 1952, involves use of such psychotropic substances as antiepileptics, soporifics, antipsychotics, antibiotic mental disorder drugs (strong mental stabilizers), and antidepressives. It is noted that drugs have been revolutionarily effective in the psychiatric field. Mental treatment is defined as psychiatric treatment, narcotic treatment, autogenic training, Morita therapy, and simple mental treatment. It is felt that these mental treatments are far less harmful than psychosurgery and drug treatment. The third

method covered is life treatment, which involves instructing psychiatric patients in such a way that they dissolve any anxiety in daily life. It is suggested that cooperation among psychiatrists, patients' families, and those in charge of mental hygiene in the schools can cure mental illness, help to eliminate the social stigma attached to mental disease, and prevent the occurrence of mental illness in normal people.

243094 Watanabe, Kichihiko; Maruko, Kazuo; Kumashiro, Hisashi; Matsuda, Taizo; Ono, Shigeharu. Department of Neuropsychiatry, Fukushima Medical College, Japan A case of phobic anxiety-depersonalization syndrome (Roth). Clinical Psychiatry (Tokyo). 17(6):575-581, 1975.

A case history is presented of a woman who showed the same symptomatic pattern as the phobic anxiety depersonalization syndrome that was described by Martin Roth in 1959. A 23-year-old Japanese woman showed symptoms shortly after being forbidden to marry her lover. Symptoms worsened and became chronic under the pressure of an unwanted marriage to another man. During a 5 month period of hospitalization, her phobic anxiety and depersonalization decreased as the result of support and drug treatment (levomepromazine and haloperidol). When her husband became the object of her love and symptoms disappeared, she was released from the hospital. Carbamazepine is indicated as treatment for depersonalization, but it is suggested that phobic anxiety seemed to be curable simply by transference of the emotional attachment. 10 references.

243183 Bloom, Floyd E. Laboratory of Neuropharmacology, NIMH, St. Elizabeths Hospital, Washington, DC 20032 The chemical control of neuronal activity. (Unpublished paper). Washington, DC, NIMH, 1975. 13 p.

In studies of central systems mediated by the catecholamines norepinephrine and dopamine, a variety of histochemical and electrophysiological indices were employed to assess the pharmacological actions of natural substances, as well as synthetic agonists and antagonists. Findings suggest that the catecholamine systems may represent a complex interneuronal control system with profound dependence upon the biological properties of their postsynaptic target cells. Evidence which implicates cyclic 3',5'-adenosinemonophosphate as a second messenger in catecholamine mediated neurotransmission is presented. 27 references.

243820 Post, Robert M. Section on Psychobiology, Adult Psychiatry Branch, NIMH, Bethesda, MD 20014 Comparative psychopharmacology of cocaine and amphetamine. Bethesda, MD, NIMH, 1975. 5 p.

The behavioral pharmacology of cocaine and amphetamine is reviewed with specific focus on their capabilities of producing sensitization on reverse tolerance phenomena with repetitive administration. Studies of these effects in both humans and animals are cited. It is demonstrated that although the pharmacological effects of these two psychomotor stimulants differ, both cocaine and amphetamine appear to induce a similar spectrum of clinical effects in man and behavioral and neurological sequella in a variety of laboratory species. It is noted that preliminary studies in a number of laboratories suggest that the apparent sensitization to the effects of psychomotor stimulants is not related to increasing blood, brain, or

cerebrospinal fluid levels of these compounds with chronic administration. The progressive behavioral phenomena do not appear to be adequately explained by conditioning phenomena, since repetitive administration appears to result in the de novo appearance of stereotypies, dyskinesias, and seizures. The relationship between reverse tolerance and kindling phenomenon is also discussed. 8 references.

243862 Zung, William W. K. VA Hospital, Durham, NC 27705 *The role of rating scales in the use of antidepressants. Diseases of the Nervous System.* 37(3 Section 2):22-24, 1976.

The use of rating scales in determining the effectiveness of antidepressant medication is examined. Rating scales are defined and described, and some of their applications are surveyed. It is noted that the use of rating scales may pigeonhole a drug as effective in only a particular disorder, when, in fact, it is of value in a broad spectrum of disorders. This pigeonholing is due to the type of rating scale chosen by the investigator. Aside from drug testing, the role of rating scales in the everyday practice of medicine is illustrated. The physician can have patients complete self-rating scales to help determine the proper diagnosis and to evaluate the potency of the prescribed medication. While the rating scales can serve as a diagnostic aid, the physician is still dependent upon his ability to practice the art of medicine.

244023 Achte, Kalle A. no address */The placebo effect./ Die Placebo-Wirkung. Psychiatria Fennica (Helsinki).* No. 6:289-297, 1975.

The significance of the placebo effect in psychopharmacological research is discussed, and the importance of interaction effects and of comparing only objectively comparable experimental groups is emphasized. It is noted that in many psychopharmacological evaluation studies, the placebo often induces more subjective side-effects than the drugs being tested, and that it often has positive therapeutic action. The influence of personality factors and of the doctor-patient relationship on placebo effects is discussed. 103 references.

244037 Carlsson, A. Dept. of Pharmacology, University of Göteborg, Göteborg, Sweden */On psychopharmacological research and the understanding of schizophrenia./ Der Beitrag der Arzneimittelforschung zum Verständnis der Schizophrenie. Wiener Medizinische Wochenschrift (Wien).* 125(21):308-317, 1975.

It is observed that although schizophrenia is not a general anatomical or biochemical disease, recent psychopharmacological research has indicated the important role of catecholamine metabolism. The commonly used neuroleptics seem to reduce central catecholamine functions, and amphetamines seem to affect the postsynaptic receptors by relieving a considerable catecholamine insufficiency. For each medication type, the influence of dopamine is important, and noradrenaline is also felt to play a role. Some studies have indicated that dopamine synthesis in the limbic regions is more important for psychic functions than in the striatum, where motor functions are primarily controlled. It is suggested that schizophrenia may be a complex disturbance in the homeostasis of a number of antagonistic neurochemical functions, of which the catecholamine and dopamine systems are a part. 56 references.

244038 Pletscher, A. Forschungsabteilung F. Hoffmann-La Roche, A. G., CH-4002, Basel, Switzerland */Dopaminergic-cholinergic interactions in the central nervous system: biochemical-pharmacological aspects./ Dopaminerg-cholinerge Wechselwirkung im zentralen Nervensystem: Biochemisch-phar-*

makologische Aspekte. Wiener Medizinische Wochenschrift (Wien). 125(21):322-324, 1975.

Results of recent research which shed light on the functional interaction between dopaminergic and cholinergic neurons in the striatum are cited. The cholinergic neuron regulates the sensitivity of its dopamine receptor, and the dopaminergic neuron regulates its sensitivity to the acetylcholine from the excited cholinergic neuron. In addition, the presynaptic dopamine receptor of the dopaminergic neuron introduces a factor of negative feedback. It is noted that there is evidence that, in the limbic system the cholinergic neurons have an activating influence on the dopaminergic neurons. A disturbance in this interaction may be the cause of Parkinsonism. It is suggested that as a result of dopamine insufficiency, the cholinergic preponderance expresses itself in rigidity and tremors. This may also explain why anticholinergics have a positive effect on extrapyramidal symptoms resulting from neuroleptic treatment, without interfering with the antipsychotic effect of the drug. 28 references.

244039 Hornykiewicz, O. Dept. of Psychopharmacology, Clarke Institute of Psychiatry, Toronto M5T 1R8, Ontario, Canada */Biochemical-pharmacological bases for the clinical use of L-dihydroxyphenylalanine in Parkinson's syndrome./ Biochemisch-pharmakologische Grundlagen für die klinische Anwendung des L-Dioxyphenylalanins beim Parkinson-Syndrom. Wiener Medizinische Wochenschrift (Wien).* 125(21):325-327, 1975.

It is noted that early experimental pharmacological research led to the discovery of the therapeutic effect of reserpine, an alkaloid of *Rauwolfia serpentina*, on Parkinsonism. It was observed that reserpine also affects the nervous control of the peripheral organs, including the heart and digestive systems, seemingly through the activation of their adrenaline, noradrenaline and serotonin content. Following the discovery of the new catecholamine dopamine in 1959, it was observed that dopamine insufficiencies in the brain are linked both to the specific and extrapyramidal symptoms associated with Parkinsonism, and it was demonstrated that an increase in the dopamine levels in the brain leads to improvement of the symptoms. L-dopa serves this therapeutic purpose as it is decarboxylized in the brain to dopamine by a specific decarboxylase.

244063 Derogatis, Leonard R. Johns Hopkins University School of Medicine, Baltimore, MD 21218 *Development of drug sensitive symptom rating scales. Final Report, NIMH Grant MH-24354, 1975. 7 p.*

An integrated, reliable, and matched set of psychological symptom rating scales were developed that have validity for the reflection of treatment induced change. The scales were designed to be sensitive to the effects of psychotherapeutic drugs as well as other nonpharmacologic treatment forms. Major emphasis was on outpatient populations, both psychiatric and medical.

244433 Collard, J. Université de Liège, Clinique Psychiatrique, Liège, Belgium */Sulpiride as a current antidepressive technique: what can be said and thought about it today?/ Le sulpiride parmi les techniques antidépresseuses de pointe. Aujourd'hui qu'en dire, qu'en penser? Revue Médicale de Liège (Liège).* 31(4):135-138, 1976.

Various properties of sulpiride are discussed. Sulpiride seems to be a "neuroendocrinal" agent. Similar to methoclopramide, it is an o-anisamide. In low doses, sulpiride

has an antidepressant effect and in high doses it is a neuroleptic. Thyroid releasing hormone (TRH), which is used in psychiatric drug therapy, is similar to sulpiride. TRH, like sulpiride, can cause galactorrhea because both drugs are prolactin inductors. Both drugs are effective in treating depression. 16 references.

244875 Snibbe, John R. Psychiatric Hospital, Los Angeles, CA 90033 *I. Psychopharmacology and the need to know. Professional Psychology.* 6(2):167-169, 1975.

A case is made for teaching psychologists and other nonphysician mental health professionals about psychoactive medications, commonly abused drugs and recognition of medical problems. It is noted that an increasing number of nonphysician professionals are in frequent contact with patients who use and abuse a wide variety of medications and that, therefore, they should be informed about the action and problems associated with such drugs. It is urged that courses in psychopharmacology for the psychologist be established in graduate schools and other training institutions. 3 references.

245524 Keeler, Martin H.; McCurdy, R. Layton. Department of Psychiatry, Medical University of South Carolina, 80 Barre St., Charleston, SC 29401 *Medical practice without antianxiety drugs. American Journal of Psychiatry.* 132(6):654-655, 1975.

Data from the central records of a state in which hydroxyzine and the benzodiazepines were removed from the Medicaid pharmacopoeia are summarized to indicate pertinent changes in the prescription of psychotropic medications in the treatment of anxiety. No substitution for these deleted ataractic drugs was made in 64% of the cases recorded. The small amount of substitution is considered due to the extreme cautiousness of physicians in their prescription of psychotropic drugs; it is suggested that physicians view the ataractics as less dangerous and were reluctant to substitute drugs with greater incidence of overdose and side-effects. It is concluded that the ataractics should be the drug of choice in treatment of anxiety; that they were deleted for purely economic reasons; and that they should be made available again. 2 references.

245873 Essman, W. B.; Valzelli, L. no address *Current developments in psychopharmacology, volume I.* New York, Halsted Press, 1975. 345 p. Vol. 1. \$24.00.

Current developments in psychopharmacology are reviewed, including research on dopamine receptors and their role in brain function, rubidium in psychiatry and medicine, clinical psychopharmacology of the affective disorders, and drug effects in the assessment of affective states in man.

246033 Snodgrass, Robert E. 532 Turtle Creek, North Drive, Suite A-1, Indianapolis, IN 46227 *Practical clinical psychopharmacology: the tranquilizers. Journal of the Indiana State Medical Association.* 68(10):883-887, 1975.

The characteristics of various tranquilizers commonly used in practical clinical pharmacology are reviewed for the benefit of the nonpsychiatric physician, with particular attention given to their side effects. The action and effects of the first major antipsychotic neuroleptics, which were Rauwolfia derivatives, are first considered, followed by those of the phenothiazines (Thorazine, Stelazine, and Mellaril), the butyrophenones (Haldol) and thioxanthenes (Navane and Taractan). The minor or antianxiety tranquilizers, which include Miltown or Equanil, Librium, and Valium are also described. It is urged that the practicing physician become familiar with several of the psychotropic drugs and know how to use them properly. 11 references.

246123 Bruschi, Walter C. Mental Health and Behavioral Sciences Service, Veterans Administration Center, Leavenworth, KS 66048 */Psychopharmacology, psychosis and freedom./ Psychopharmacologie, psychose et liberte. Vie Medicale au Canada Francais (Quebec).* 4(9):1063-1067, 1975.

In a paper presented at the symposium on Psychosis and Liberty held by the Psychiatry Department of Laval University, Quebec, April 1973, the effects of changing views about mental illness and its treatment on psychopharmacology are discussed. The experimental nature of the use of psychotropic substances is acknowledged, as is the difficulty confronting the diagnostician who must determine whether the patient is suffering from schizophrenia or affective psychosis before deciding on the drugs to be used in treatment. Views of phenomenological and existential schools of psychology are used to explain how psychopharmacology can restore the human development interrupted by the psychosis. 12 references.

246126 Bury, Jacques-A.; Montgrain, Noel; Pomerleau, Guy. Centre hospitalier de l'Universite Laval, Quebec, Canada */Summary of the discussions at the symposium "psychosis and freedom"./ Resume des discussions au symposium "psychose et liberte". Vie Medicale au Canada Francais (Quebec).* 4(9):1081-1085, 1975.

Several of the topics discussed during the symposium on Psychosis and Freedom, held by the Psychiatry Department of Laval University, Quebec, April 1973, are summarized. The opinions of those involved in the psychiatry vs. antipsychiatry debate are reported with attention given to the related question of the freedom of the psychotic vs. the freedom of the psychiatrist or psychoanalyst to treat him. Differing views on the qualities of a therapist, the role of the psychotic in the formation of the psychiatrist, and the practical aspects in the treatment of the psychotic are presented. The report ends with a summary of the discussion on psychotropic drugs, specifically, neuroleptics.

246612 Kolakowska, Tamara. Department of Psychiatry, University of Oxford, Littlemore Hospital Research Unit, Oxford, OX4 4XN, England *The clinical course of primary recurrent depression in pharmacologically treated female patients. British Journal of Psychiatry (London).* 126:336-345, 1975.

The clinical course of pharmacologically treated recurrent affective illness in 70 female patients is presented. The symptoms and rhythm of depressive attacks, the quality of remission, and the associations between background data, symptoms, and clinical course are described. It was found that over half of all depressive episodes lasted less than 3 months and recurred within one year. Atypical depression, with neurotic, hypochondriacal or involutional characteristics appeared in 35 patients during one or more episodes. Recurrences within one year throughout the illness were characteristic for 23% of the group, and in a further 38.5% remissions contracted to less than one year after two to six episodes. Duration of the episodes usually either remained unchanged (49%) or increased (41%). All but one subject made a complete recovery from the first depression. Brief and poor remissions were more common over the age of 50, but the age of onset was considered to be of no important prognostic significance. Brief remissions and suicidal attempts were more common among patients with bipolar illness. The group differed from the classical course of manic-depressive illness by showing a relatively common occurrence of brief, mild and/or atypical depressive episodes separated by brief and partial remissions. The possible relation of these characteristics to the effect of the treatment is discussed. 37 references. (Author abstract modified)

246617 Maxmen, Jerrold S.; Silberfarb, Peter M.; Plakun, Eric. Sound View-Throgs Neck Community Mental Health Center, Bronx, NY 10461 **Pentazocine abuse and problems of withdrawal.** *British Journal of Psychiatry* (London). 126:370-371, 1975.

Pentazocine abuse and problems of withdrawal are reported in a patient who developed a peculiar movement disorder and delirium after receiving hypnotics and phenothiazines during pentazocine withdrawal. Four possible explanations for the withdrawal symptoms are advanced: 1) they are a manifestation of a seizure disorder; 2) they represent a dyskinetic reaction; 3) they are indicative of central structural or chemical changes; and 4) they are not related to abstinence from pentazocine. It is noted that pentazocine is generally well tolerated and when side-effects do occur they are thought to be dose related. It is felt that the high dose of pentazocine used by the patient, as well as the 4 year duration of her drug abuse, may have contributed to her unusual reaction to hypnotics and phenothiazines. 6 references.

246969 Hoffman, D. J.; Chun, A. H. C. Dept. of Pharmaceutical Research and Development Services, Pharmaceutical Products Div., Abbott Laboratories, North Chicago, IL 60064 **Paramethadione and metabolite serum levels in humans after a single oral paramethadione dose.** *Journal of Pharmaceutical Sciences*. 64(10):1702-1703, 1975.

A gas/liquid chromatographic (GLC) method was developed to determine quantitatively paramethadione and its major metabolite, 5-ethyl-5-methyl-2,4-oxazolidinedione, in serum. The method was reproducible and sensitive to 0.2 microgram/ml. After administering a single 300mg oral dose to human subjects, the average paramethadione serum levels of 6.0mg/ml occurred at 1 hour and decreased to 0.3mg/ml after 48 hours. Metabolite serum levels gradually increased to 8.4mg/ml at 32 hours and were still at this level at 48 hours, which was the last sampling point. 6 references. (Author abstract)

247143 Sampson, Paul. American Medical Association, 535 North Dearborn Street, Chicago, IL 60610 **Drugs help, but won't cure, most hyperactive children.** *Journal of the American Medical Association*. 232(12):1205, 1208, 1215-1216, 1975.

In a discussion of pharmacologic treatment of hyperkinesis, held at a Chicago symposium on hyperkinetic children, psychotherapy was recommended as an adjunct to treatment with central nervous system stimulants. It was contended that while medication is effective in reducing symptoms, psychotherapy can aid in the emotional adjustment of both child and family. The effects and dosages of the stimulants most widely used in treating hyperkinesis were described, and some of the more innovative methods were examined, such as the Feingold diet, megavitamin therapy and relaxation techniques.

247376 Sprague, Robert L.; Sleator, Esther K. Children's Research Center, University of Illinois, 51 Gerty Drive, Champaign, IL 61820 **What is the proper dose of stimulant drugs in children?** *International Journal of Mental Health*. 4(1-2):75-104, 1975.

Important considerations in determining the proper dose of stimulant drugs in treating children, particularly hyperkinetics, are discussed. A review of clinical and animal studies indicates that: 1) dose/response relationships are important to the clinician as well as to the more theoretically oriented researchers; 2) dose/response relationships differ for different target

behaviors; and 3) the titration method, which uses social behavior as the main criterion for determining dosage of stimulant medication, is open to criticism. It is contended that there is evidence that doses considered optimal when this method is used, as recommended and accepted in pediatric psychopharmacology, are not only well above the optimal range for cognitive performance, but are, in fact deleterious to cognitive performance. Both the titration method of determining dosage and the empirical facts obtained with this method are therefore challenged. 58 references. (Author abstract modified)

247381 Katz, Sidney; Saraf, Kishore; Gittelman-Klein, Rachel; Klein, Donald F. Long Island Jewish-Hillside Medical Center, Glen Oaks, NY 11004 **Clinical pharmacological management of hyperkinetic children.** *International Journal of Mental Health*. 4(1-2):157-181, 1975.

The long-term pharmacological management of hyperkinetic children is discussed, based on followup observations of over 150 such children and children with learning disabilities. It is contended that the syndrome of the hyperactive child is not a single entity, that the phenomenology and treatment are far from precise, and that the etiology is unclear and the subsequent course is still not known. Treatment is considered to be time consuming and to require close contact with parents and school, as well as a constant review of treatment strategies. General guidelines suggested for dealing with such children are: 1) children with some, but not all, the symptoms should be given medication on a trial basis; 2) stimulants are the drugs of choice; 3) dosage and schedule of medication are specific to each child and should be closely monitored; 4) in many cases, the families, children, and teachers require additional help, such as counseling, behavior modification, and/or special class placement of the child; 5) children on medication should be taken off for several weeks during the school year to evaluate need for continuous treatment; 6) the best milieu involves social workers, psychologists, and remedial educators; and 7) children should be followed up after medication has been discontinued. 11 references. (Author abstract modified)

247385 Satterfield, James H.; Cantwell, Dennis P. Gateways Hospital, 1891 Effic St., Los Angeles, CA 90026 **Psychopharmacology in the prevention of antisocial and delinquent behavior.** *International Journal of Mental Health*. 4(1-2):227-237, 1975.

Clinical and followup studies are reviewed which suggest that one psychiatric disorder of childhood, the hyperactive child syndrome (minimal brain dysfunction), may be a precursor of juvenile delinquency and adult sociopathy. The effectiveness of treatment on antisocial outcome is also considered. Studies of adult sociopaths and hyperactive children indicate similar clinical, EEG, neurophysiological, behavioral, and psychological abnormalities in the two groups, and longitudinal studies of children who later become sociopathic suggest that they suffer from childhood problems in many ways similar to those of hyperactive children. Followup studies of hyperactive children in their early and midteens report serious delinquent behavior, while family studies suggest a familial relationship between childhood hyperactivity and adult sociopathy. While treatment with stimulant drugs has proven effective in reducing the early antisocial behavior and improving intellectual functioning, the question of whether this treatment also prevents subsequent serious delinquency or adult criminal behavior is noted to be far more debatable. Further long-term clinical and family studies of hyperactive children are recommended. 23 references.

247386 Campbell, Magda. New York University Medical Center, 550 First Avenue, New York, NY 10016 *Psychopharmacology in childhood psychosis*. International Journal of Mental Health. 4(1-2):238-254, 1975.

Psychoactive agents used in treating psychosis in children are reviewed, stressing the difficulties of precise evaluation of the effectiveness of psychopharmacology in such patients and the lack of reliable research findings. The effectiveness of some of the tricyclic antidepressants, phenothiazines, butyrophenones, thioxanthenes, indoles, and anxiolytics are discussed, in terms of their effects on the types of childhood psychoses, such as autism, schizophrenia, and retardation. Recent trials with lithium, triiodothyronine and levodopa in young patients are also considered. It is contended that administration of psychopharmacologic agents is only a part of the treatment of the child, and that a particular drug therapy should be discontinued if it interferes with maturation, development, and learning. It is recommended that the nature of the psychotic child's behavior, parental attitudes toward drug therapy, dosage, side-effects, and duration of drug treatment should each be considered carefully when planning and implementing a long-term treatment strategy. 74 references.

247546 Scotto, J. C. Clinique Universitaire de Psychiatrie, Hopital de la Timone, 13385 Marseilles, France /The substituted benzamides./ Les benzamides substituees. Encephale (Paris). 1(3):223-225, 1975.

At the 9th Session on Psychiatric Information, held in Marseilles, March 1975, clinical observations concerning the therapeutic effects of three molecules belonging to the substituted benzamide family were reported. It was observed that the three products were generally well tolerated by the organism, and that at sufficient doses they act as major tranquilizers: sulphiride chiefly as a disinhibitor but with antipsychotic properties; sultopride as somewhat sedative at first, especially when given parenterally, then antipsychotic, and little by little disinhibiting; GRI 16-65 as soothing, euphoriant, socializing and antipsychotic. It was concluded that the effect of reintegration in reality seems to be a common characteristic of the three products. (Author abstract modified)

247690 Sourkes, T. L. Department of Psychology, McGill Univ., Montreal, Quebec, Canada *Neural and Neuroendocrine functions of dopamine*. Psychoneuroendocrinology. 1(1):69-78, 1975.

The functions of dopamine (3-hydroxytyramine) in the central nervous system are described. The best understood of these is in relation to the extrapyramidal system. The example of striatal function is adduced on the bases of the high concentration of dopamine in that structure and presence of this amine in the terminations of fibres originating in the substantia nigra. Dopamine containing fibres with terminals in the hypothalamus play a role in regulating secretion of growth hormone releasing factor and, perhaps others. Other monoamines seem to be similarly related to other releasing factors. It is noted that this new understanding of the neurochemistry of the monoamines has aided in clarifying the neural pathways that regulate the anterior pituitary gland. 48 references. (Author abstract modified)

247712 Stern, Gerald. no address *The clinical uses of levodopa*. Lancaster, England, Medical & Technical Publishing, 1975. 157 p. L5.75.

Research on the therapeutic effects of levodopa is reviewed and the use of levodopa in the treatment of parkinsonism is

described. Topics discussed include selection of patients, therapeutic effects, side effects, decarboxylase inhibitors, and neuropsychiatric aspects of levodopa treatment.

247880 Appleton, William S. 51 Brattle Street, Cambridge, MA 02138 *Third psychoactive drug usage guide*. Diseases of the Nervous System. 37(1):39-51, 1976.

A psychoactive drug use guide based on a review of controlled drug studies is presented in outline form to provide information on dosage, indications for prescribing, efficacy, and incidence and treatment of side effects of the principal psychoactive drugs. Drugs included in the guide are: 1) phenothiazines (aliphatics, piperazines, and piperidines); 2) butyrophenones (haloperidol, triperidol, and benzperidol); 3) thioxanthenes (central nitrogen atom of phenothiazine nucleus replaced by a carbon); 4) oxindoles (tetrahydrooxindole); 5) Rauwolfia alkaloids; 6) antipsychotic agents not available in the U.S. (benzoquinolizine, indolalkylphenylpiperazine, acridans, and dibenzoxazepines); 7) drugs used in the treatment of depression (tricyclic derivatives, certain inhibitors, and stimulants); 8) anti-anxiety drugs (minor tranquilizers); 9) lithium carbonate (eskalth, lithane, and lithonate); and 10) miscellaneous (levodopa, megavitamin therapy, thyroid therapy, propranolol, diphenylhydantoin, methylodopa, alpha methylparatyrosine, opiates, and rubidium). 12 references.

248166 no author. no address *The Tokyo assembly of the World Medical Association*. Medical Journal of Australia (Sydney). 2(19):731-732, 1975.

Proceedings of the Tokyo Assembly of the World Medical Association are noted as they relate to psychotropic drugs. The World Medical Assembly states that the use of psychotropic drugs is a complex social phenomenon which is multifaceted and involves a multiplicity of causes. It is recommended that medical doctors prescribe psychotropic drugs with the greatest restraint, insuring that all prescriptions reflect accurate diagnosis, appropriate nonpharmacologic advice, and careful utilization of precise pharmacotherapeutic materials, mindful of the potential dangers of misuse and abuse. It is suggested that doctors accept the responsibility for collating and providing factual information regarding the health hazards of nonmedical use of all psychotropic material, including alcohol.

249525 Kirman, Brian. Fountain and Carshalton Hospital Group, Queen Mary's Hospital for Children, Carshalton, Surrey, England *Drug therapy in mental handicap*. British Journal of Psychiatry (London). 127:545-549, 1975.

The utilization of drugs in institutions for the mentally handicapped is evaluated. Definitions of mental handicap are felt to be imprecise in practice. It is indicated that a wide spectrum of patients are provided for under this heading. It is stressed that there can be no question of specific treatment for "mental handicap" as such. Many situations arising in institutions for the mentally handicapped are felt to derive from the nature of the institution and the regime. It is thought that drugs may be used excessively when environmental manipulation would be more appropriate. There is thought to be much overprescribing and the choice of drugs is deemed not always to be logical; monitoring of dose is said seldom to be employed. A major source of behavior disturbance in the mentally handicapped is judged to be lack of suitable occupation. Apart from a few specific indications, it is recommended that prescription of sedatives and tranquilizers for the mentally handicapped be seen as a holding device, to enable a different system of management to be adopted or to disrupt an undesirable behavior pattern. 34 references. (Author abstract modified)

249765 Dell'Aria, Salvatore; Karliner, William. Department of Anesthesiology, New York University Medical School, New York, NY 10003 *Anesthesiologic considerations in psychiatric convulsive therapy*. Behavioral Neuropsychiatry. 6(1-12):6-17, 1975.

Techniques of administering anesthesia and muscle relaxing agents for psychiatric convulsive therapy are described. After a brief historical review, the materials used and the setup for this modified electroconvulsive treatment are discussed. The signs of amnesia and muscular relaxation are described in order to administer a modified electroconvulsive treatment properly. It is felt that the use of tranquilizers and psychostimulants, concomitantly with modified convulsive therapy does not seem to increase the risk, the phenothiazines and rauwolfia alkaloids have often been associated with outward reactions and death. A comparison of this modification with various other methods used in different centers is made; contraindications for the various therapeutic methods are mentioned and a critical evaluation is provided. 11 references. (Journal abstract modified)

249768 no author. no address /*Compendium of pharmacology drug charts*./ Physicians' drug manual. Behavioral Neuropsychiatry. 6(1-12):36-66, 1975.

A compilation of 15 commercially available drugs designed for therapeutic use is presented in chart form. The drugs are categorized as anticonvulsants or antiepileptics, chemotherapeutic drugs, and tranquilizing drugs. Descriptions include the generic name, trade name, manufacturer, price to patient, formula of the drug, its type and action, indications for use, a therapeutic rating based on drug effectiveness versus toxicity, side-effects, cautions, the antidote for overdose, and recommended dosage. 141 references.

249787 Knoll, J.; Knoll, B. no address *Symposium on pharmacology of learning and retention*. First Congress of the Hungarian Pharmacological Society, v. 4. Budapest, Akademiai Kiado, 1974. 103 p. \$4.50.

Eleven contributions from the Symposium on Pharmacology of Learning Retention of the First Congress of the Hungarian Pharmacological Society are presented. Three types of presentations are included: general reviews, papers emphasizing a particular drug or group of drugs and contributions to the intimate mechanisms of learning and memory. Individual topics covered include: a comprehensive survey of electrophysiological approaches to learning mechanisms, concepts on the intracellular regulation of the interneuronal connectivity; the modulation of learning and retention by amphetamines; how the compound 2-methylthiazolidine increases brain RNA-synthesis and learning in rats and mice; a rapid screening procedure for drug actions on learning and memory; learning facilitation induced by analeptic drugs, induced by subthreshold reticular activation, and by hippocampal electrical stimulation; studies of the delaying effect on extinction; and a study of alpha-amanitin in short-term and long-term memory.

249975 no author. no address *Fact and fiction of menopause*. Nursing Times (London). 72(7):241, 1976.

Views of physicians and psychiatrists regarding the occurrence of psychiatric morbidity in menopausal women, as presented at a recent British symposium, are summarized. Most speakers are reported to have felt that although symptoms of emotional disturbance at the time of menopause are common, this does not provide a causal relationship with hor-

monal changes and estrogen deficiency. Family problems and/or changes, cultural attitudes toward menopause and other factors were suggested as primarily contributing to such disturbances. It was also contended by some that overemphasis on hormone replacement therapy (HRT) is inhibiting the investigation of other symptoms in menopausal women, and that its use should be confined to treating the somatic symptoms. Others argued that the physical and psychological benefits of HRT are important, and that there is no reason to dismiss the unpleasantness of the menopause as natural if it can be alleviated by treatment. The general conclusion of all participants was reported to be that each woman must be thoroughly examined and treated as an individual.

250266 Fanielle, J.; Parent, M.; Bobon, D. P. no address /*Ninth congress of the International Neuropsychopharmacologic Collegium or C.I.N.P.* (Paris, July 7-12, 1974)./ Neuvieme congres du Collegium Internationale Neuropsychopharmacologicum ou C.I.N.P. (Paris, 7-12 juillet 1974). Feuilles Psychiatriques de Liege (Liege). 8(1):79-88, 1975.

Papers presented and discussed at the 9th congress of the International Neuropsychopharmacologic Collegium, Paris, July 1974, are reported. The principal topics discussed were: 1) methodology of clinical trials and evaluation scales, with papers presented on the BS self-evaluation scale, on the control criteria used in clinical trials, on evaluation scales used in schizophrenia, and on audiovisual diagnostic techniques; 2) the neurochemistry of aggression and sexuality; 3) neuroendocrinological considerations regarding the interactions between hypophyseal hormones and behavior; 4) drug addiction; and 5) the psychopharmacology of lithium, sulpiride and antiparkinsonian drugs.

250711 Nightingale, Stuart L.; Dormer, Robert A.; DuPont, Robert L. National Institute on Drug Abuse, Rockville, MD 20852 *Inappropriate prescribing of psychoactive drugs*. Annals of Internal Medicine. 83(6):896-897, 1975.

The issue of physicians' alleged inappropriate prescribing of psychoactive drugs is addressed. There is said to be a great deal of concern about overprescribing of psychoactive drugs but little consensus as to the magnitude of the problem. To varying degrees, physicians, patients, and industry are considered responsible. It is thought that physicians may overprescribe for profit, because of organic or psychiatric problems, or because of a lack of current information about the issues involved. The vast majority of inappropriate prescribing is said to be due to well intentioned physicians who are poorly informed or manipulated by patients. It is indicated that the physician needs to be able to identify the drug dependent individual, treat him, and refer him to other resources in the community as appropriate. It is noted that the medical community and federal and state governments have taken steps to assist, but it is contended that individual physicians can do a great deal in this area. Much more needs to be done to properly inform the patient and make him more responsible. Collaboration between the medical community, industry, government, and the consumer is considered essential. 8 references.

250780 Greenblatt, David J.; Shader, Richard I.; Koch-Weser, Jan. Clinical Pharmacology Unit, Massachusetts General Hospital, Boston, MA 02114 *Flurazepam hydrochloride, a benzodiazepine hypnotic*. Annals of Internal Medicine. 83(2):237-241, 1975.

A brief review of research findings and other information useful in assessing the hypnotic effects benzodiazepine deriva-

tive flurazepam is presented. Flurazepam is more effective than placebo and is as effective as other hypnotic drugs in most short-term controlled studies. In long-term dosage studies, flurazepam's efficacy persists while other hypnotics become ineffective. Flurazepam has relatively minor effects upon rapid eye movement (REM) sleep and does not lead to REM rebound; this may reduce the likelihood of drug dependence. Flurazepam does not cause enzyme induction and probably presents little hazard of abuse or overdosage. The rational use of hypnotic agents depends as much upon the underlying cause of the sleep disorder as upon the choice of a particular drug. When hypnotic therapy is indicated, flurazepam appears to have advantages over other drugs currently available in the United States. 81 references. (Author abstract modified)

250856 Solow, Charles. Department of Clinical Psychiatry, Dartmouth Medical School, Hanover, NH 03755 **Psychotropic drugs in somatic disorders.** *International Journal of Psychiatry in Medicine.* 6(1-2):267-282, 1975.

Current trends in the employment of psychotropic medication in somatic illness are considered, and some of the theoretical issues raised by this practice are explored. While much further clinical investigation is needed, a review is made of currently available knowledge regarding psychopharmacotherapy in specific clinical settings: pain, delirium, ischemic heart disease, gastrointestinal disorders, dermatological illness, and in renal, hepatic and pulmonary insufficiency. It is concluded that the physician should bring to bear all of his therapeutic resources as he makes and applies decisions regarding drug therapy. 75 references. (Author abstract modified)

250928 Baldessarini, Ross J.; Lipinski, Joseph F. Psychiatric Research Laboratories, Department of Psychiatry, Massachusetts General Hospital, Boston, MA 02114 **Lithium salts: 1970-1975.** *Annals of Internal Medicine.* 83(4):527-533, 1975.

A review of the most recent and/or interesting studies on the usefulness and safety of lithium salts as an antipsychotic agent is presented. Lithium ion provides a useful and specific form of chemotherapy for manic and hypomanic episodes, although its antimanic effect may be delayed for as long as a week or more, requiring the use of antipsychotic agent in the initial period to control the behavior of very disturbed patients. The mechanisms of action of lithium remain obscure, but probably involve effects on neuronal and hormone target cell membranes. Lithium has interesting antithyroid and antidiuretic hormone effects that are potentially useful medically. The main limitation of the use of lithium is its narrow therapeutic index and requirement of close medical supervision. The most promising aspects of the use of lithium are its encouragement of better psychiatric diagnosis and its prophylactic effectiveness in at least reducing the frequency and severity of manic and depressive attacks in manic-depressive illness. 75 references. (Author abstract modified)

250935 Reuter, Celia J. Servier Research Institute, Greenford, Middlesex UB6 7PW, England **A review of the CNS effects of fenfluramine, 780SE and norfenfluramine on animals and man.** *Postgraduate Medical Journal (Oxford).* 51(1):18-27, 1975.

At a symposium organized by the Servier Research Institute held in Marbella, Spain March 1974, a review of the changes in body functions produced by administration of fenfluramine, its benzoyloxyethyl derivative 780SE (992), and a metabolite common to both, norfenfluramine were discussed. The effects of each drug on eating, drinking, behavior, sleep, body tem-

perature regulation, pain perception, neuroendocrine functions and mood are noted. It is reported that fenfluramine and 780SE appear to share qualitatively similar effects on the brain amines, anorexia, behavior and sleep. Norfenfluramine, however, differs quantitatively with a more pronounced and prolonged effect on central catecholamine pathways. In man, its sympathomimetic potency has been reported to be responsible for the mydriatic effect of fenfluramine. It is reported that norfenfluramine has a greater thermogenic potency and is more toxic. Stereospecificity with fenfluramine and norfenfluramine appear to be parallel, the d-isomers being more potent on anorexia, and possibly slightly effective on serotonin depletion, mydriasis, hyperthermia and toxicity, whereas the l-isomers are more active on central catecholamine turn over and analgesia. The activities of the racemic mixture, the marketed form, are intermediate between the d and l. Drug interaction studies in animals suggest that the anorectic activity of these compounds may be impaired, especially with some tricyclic antidepressants and that careful dosage titration may be necessary in combination with other sedatives and narcotic analgesics. 89 references.

251129 Geisler, A.; Vendsborg, P. B.; Johannesen, M.; Klynsner, R.; Thomsen, J. Psychochemistry Institute, University of Copenhagen, DK-2100 Copenhagen, Denmark **The effect of lithium on unstimulated and glucagon-stimulated urinary cyclic AMP excretion in rat and man.** *Acta Pharmacologica et Toxicologica (Copenhagen).* 38(5):433-439, 1976.

The effect of long-term lithium treatment on unstimulated and glucose stimulated cyclic AMP excretion is studied in rats and in man, with the objective of determining whether lithium also inhibits hormone stimulated adenylate cyclase in vivo. The influence of lithium on plasma glucagon degradation is also investigated. It was found that in the rat lithium doubled unstimulated and glucagon stimulated urinary cyclic AMP excretion. In lithium treated rats plasma glucagon concentration thirty minutes after intraperitoneal injection were twice that of the control rats. In man, lithium affected neither cyclic AMP excretion nor glucagon degradation. These results offer no support for the hypothesis that in vivo lithium in general inhibits hormone stimulated adenylate cyclase. However, in the intact organism lithium may have additional pharmacological actions, and complex regulatory mechanisms which may modify the cyclic AMP metabolism. Therefore it is deemed premature to conclude that lithium per se does not have an inhibitory action on glucagon sensitive adenylate cyclase in vivo. 19 references. (Author abstract modified)

251149 Neisworth, John T.; Kurtz, P. David; Ross, April; Madle, Ronald A. College of Human Development, Pennsylvania State University, University Park, PA 16802 **Naturalistic assessment of neurological diagnoses and pharmacological intervention.** *Journal of Learning Disabilities.* 9(3):149-152, 1976.

The shortcomings of an exclusively medical or clinical approach to the administration and supervision of drug therapy for children who demonstrate learning and behavioral problems are discussed. To insure precautions in the prescription and surveillance of drug treatment, certain minimal standards are proposed: 1) translation of the clinical diagnosis into measurable naturalistic behaviors; 2) collection of data by parents and teachers on behaviors to determine severity of the syndrome; 3) situational validation or disconfirmation of the clinical diagnosis; and 4) when indicated, formative assessment of drug treatment. The use of these four standards is illustrated with a preschooler who was scheduled for drug treatment. Resulting data permitted reconsideration of the clinical

diagnosis and preempting of drug treatment. 10 references. (Journal abstract modified)

251232 no author. no address Department seeks advice on safety of psychotropics. *Nursing Times* (London). 72(8):282, 1976.

The defense of the British Department of Health is briefly noted in response to questions by Labour MP Christopher Price as to the quality, quantity and safety of psychotropic drugs, (particularly Largactil and Modectate) prescribed by doctors in the National Health Service (NHS). The NHS maintained that the quantity used was confidential between itself and the manufacturers; further, the patients' progress is monitored for clinical assessment of drug effects, and there is no evidence of permanent personality change from drug use.

251238 Elliott, Henry, W.; George, Robert, Okun, Ronald. California College of Medicine, University of California, Irvine, CA 92664 Annual review of pharmacology and toxicology. Palo Alto, Annual Reviews, 1976, 566p. Vol. 16.

Thirty papers on drug research, contributed by pharmacologists and scientists, are presented, nine of them dealing predominantly with aspects of toxicology. Toxicology is discussed in relation to therapeutics, accidental or industrial poisoning, psychotropic drugs, and methods of evaluating pulmonary toxicity. Other topics include the neuropharmacology of pancreatic islets, abnormal lung function, gastrointestinal pharmacology, diuretics, the pharmacology of the pineal gland, therapeutic implications of bioavailability, organic nitrate metabolism, lipid preoxidation, renin therapy in hypertension, sulfonamides, anesthetics, and a review of drug reviews.

251320 Holland, O. Bryan; Kaplan, Norman M. Department of Internal Medicine, University of Texas Health Science Center, 5323 Harry Hines Blvd., Dallas, TX 75235 Propranolol in the treatment of hypertension. *New England Journal of Medicine*. 294(17):930-936, 1976.

The effectiveness of and problems encountered in the use of propranolol, a beta-adrenergic blocker, as a treatment for hypertension are discussed. Propranolol's acute and chronic mechanism of action are described. Therapeutic effectiveness, special uses of propranolol as an antihypertensive, and side-effects are examined; and recommendations for use are presented. It is concluded that the availability of propranolol provides the clinician with another drug that should help in the successful treatment of hypertension. 89 references.

251407 Boksay, I. J. E.; Weber, R. -O. Hoechst-Roussel Pharmaceuticals Inc., Route 202-206 North, Somerville, NJ 08876 /Chemistry and pharmacology of DIV 154, a new potential nontricyclic antidepressant compound./ *Chemie und Pharmakologie von DIV 154, einer neuen potentiellen nichttricyclischen antidepressiven Verbindung*. Naunyn-Schmiedeberg's Archives of Pharmacology (Berlin). 293(Suppl.):R12, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft, held in Mainz, Germany, March 23 through 26, 1976, a new potential nontricyclic antidepressant compound, DIV 154, is discussed. It is noted that DIV 154 has a novel chemical structure consisting of cumarilic acid-(N-benzyl-piperazyl)-amide hydrochloride. It was synthesized by Weber in the chemical laboratories of Hoechst AG, Werk Albert. It is reported that DIV 154 does not affect the normal gross behavior of animals at doses which antagonize the effect of reserpine, tetrabenazine and perphenazine. The minimum oral dose of DIV 154 necessary

to antagonize reserpine in mice is given as about 5.0mg/kg. Spontaneous locomotor activity in mice is observed to be increased only after oral application of 100mg/kg DIV 154. Without having a sedative effect, it reduces the fighting behavior of mice, electroshock induced seizures, but not pentetrazol or strychnine induced convulsions. The effect of L-Dopa in mice pretreated with phenelzine, a MAO-inhibitor, was slightly increased. No apomorphine or tryptamine synergism was observed, and hexobarbital anesthesia was not influenced. The central anticholinergic effect of DIV 154 is said to be negligible. The peripheral autonomic system is not found to be influenced by DIV 154. DIV 154 is said to increase the effect of epinephrine on the nictitating membrane and to have a biphasic effect on the norepinephrine induced contraction of isolated cat spleen slice. DIV 154 is observed to inhibit phosphodiesterase and is said to be well tolerated. Its therapeutic index is said to be large. In the first clinical investigations, it is thought that DIV 154 displayed an interesting alternative in the treatment of various depressive conditions. (Author abstract modified)

251408 Hermann, W.; Schermann, H.; Fernandes, M. Institute of Neuropsychopharmacology, Free University Berlin, D-1000 Berlin 19, Ulmenallee 30, Germany Cross tolerance between morphine and other analgesics. *Naunyn-Schmiedeberg's Archives of Pharmacology* (Berlin). 293(Suppl.):R12, 1976.

In a paper presented at the 17th Spring Meeting of the Deutsche Pharmakologische Gesellschaft in Mainz, Germany, March 1976, a report is made of cross tolerance experiments performed in order to reveal similarities of different drugs to morphine. Generally, log/dose response curves were determined before and after morphine treatment in hot plate, hypothermia, and lethality. Morphine-HCl (128mg/kg) was administered s.c. twice daily to mice. By this treatment the log/dose response relationships of morphine shifted parallel to higher doses by 0.9+ in the hot plate test, 0.8+ in hypothermia and 0.3+ in lethality. Morphine treatment caused the same shifts of methadone dose response curves, that means complete cross tolerance occurred. No cross tolerance could be observed to tillidine-HCl and codeine in all three test situations. Likewise, there was no shift of pentazocine dose response relationships in lethality and hypothermia, whereas a small shift of 0.4+ in the hot plate revealed partial cross tolerance in this test. The results show, that cross tolerance is a reasonable indicator of drug similarities but that the degree of it depends on the test situation. "(+)" logarithm of the ratio of doses which lead to the same effect in naive and tolerant animals. (Author abstract modified)

251751 Mason, Aaron S. Department for Human Resources, Commonwealth of Kentucky, Lexington, KY Basic principles in the use of antipsychotic agents. *Current Psychiatric Therapies*. 15:135-145, 1975.

Basic principles of using antipsychotic agents are discussed, stressing that their psychotherapeutic effectiveness depends on the physician's knowledge of available drugs and the skill with which they are applied. Taking a comprehensive drug history, noting target symptoms, and narrowing the choice drug to one of the three types of phenothiazines, one of the two thioxanthenes, and the butyrophenone derivatives are essential; only one agent should be used at a time. Adequate dosage is extremely important; rapid tranquilization is indicated for patients with severe psychotic symptoms; megadoses may be used with chronic refractory patients; and daily administrations is necessary with intermittent drug holidays to assess progress. 20 references.

251752 Soskin, Robert A. Veterans Administration Hospital, Topeka, KS Dipropyltryptamine in psychotherapy. *Current Psychiatric Therapies*. 15:147-156, 1975.

The value of dipropyltryptamine (DPT), a tryptamine derivative with hallucinogenic properties, as a therapeutic adjunct in alcoholic, neurotic, and terminal illness patients is discussed. It is contended that: 1) DPT can be administered orally or intramuscularly at varying dosages depending on the degree of reality contact desired; 2) it is most valuable for patients with strong motivation to change, who are committed to self-discovery; 3) many strategies which evolved from use of psychedelic drugs are applicable; 4) drug free interviews are necessary before it is administered to establish the therapeutic relationship; 5) the treatment setting depends on the dosage used; 6) the therapist is in the background of the patient's awareness and he assumes the role of an emotionally supportive figure; 7) number of sessions and treatment duration vary as a function of patient's psychopathology, personality, motivation, and available environmental supports; and 8) the aim with dying patients is to facilitate the psychedelic peak experience and relieve depression, anxiety, death fear, and psychological isolation. 15 references.

251755 Greenblatt, David J.; Shader, Richard I. Clinical Pharmacology Unit, Massachusetts General Hospital, Boston, MA Urgent pharmacotherapy for drug abuse. *Current Psychiatric Therapies*. 15:171-179, 1975.

Current trends and problems in the pharmacological management of acute drug abuse are briefly reviewed. Urgent pharmacotherapy is seen as necessary for cases of hypoglycemia, sedative/hypnotic overdose, opiate overdose, alcohol withdrawal, anticholinergic toxicity, amphetamine poisoning, and panic as a result of hallucinogenic drug experience. It is contended that: 1) inappropriate or unnecessary pharmacotherapy for drug abuse emergencies can lead to avoidable iatrogenic morbidity; 2) urgent pharmacotherapy is clearly indicated for relatively few circumstances; and 3) in most situations, the most rational approach includes a cautious observation and supportive therapy until the acute drug induced syndrome wanes and terminates by itself. 49 references.

252134 Spencer, P. S. J. Welsh School of Pharmacy, University of Wales' Institute of Science and Technology, Cardiff, Wales Some aspects of the pharmacology of analgesia. *Journal of International Medical Research* (Northampton). 4(2):1-14, 1976.

In a paper presented at a symposium on psychotropic drugs and pain, held at Stratford-upon-Avon, England, the pharmacological properties of the opiate analgesics and the tricyclic antidepressants are compared in order to justify the clinical examination of the tricyclics as potential analgesic or proanalgesic agents in man. Four areas are reviewed: the juxtapositions of the opiates and the tricyclics within the total spectrum of psychotropic drugs; recent studies with opiate analgesics; the antidepressant action of tricyclics and opiate analgesics; and a new study which shows that certain tricyclic antidepressants (notably clomipramine) exert substantial potentiating effects on morphine, cyclazocine, and pentazocine analgesia. The thesis of the paper is that the antidepressant actions of the tricyclics are due in some way to their ability to block the presynaptic reuptake mechanisms, and therefore promote the physiological actions, of one or more neurotransmitter amines in the brain. Clinical consequences of this thesis are identified. 12 references. (Author abstract modified)

252135 Hart, F. Dudley. Westminster Hospital, London, England The use of psychotropic drugs in rheumatology. *Journal of International Medical Research* (Northampton). 4(2):15-19, 1976.

In a paper presented at the symposium on psychotropic drugs and pain, Stratford-upon-Avon, England, the possible role of various psychotropic drugs in the management of rheumatic diseases is considered. Drugs discussed include: tranquilizers, sedatives, tricyclic antidepressants, and monoamine oxidase inhibitors. The dilemma of which antidepressant for which patient is considered. The possible association between rheumatoid disease and disorders of the brain, brainstem, and autonomic nervous system is discussed. It is noted that psychotropic drugs may affect the disease itself as well as the patient's mood. The idea that rheumatoid arthritis may be regarded as a psychosomatic disease, however, is rejected. 7 references. (Author abstract modified)

252137 MacNeill, A. L.; Dick, W. Carson. Department of Psychiatry, Duke St. Hospital, Glasgow, Scotland Imipramine and rheumatoid factor. *Journal of International Medical Research* (Northampton). 4(2):23-27, 1976.

In a paper presented at the symposium on psychotropic drugs and pain, Stratford-upon-Avon, England, evidence in contradiction to the previously reported finding that imipramine reduces the titer of rheumatoid factor in schizophrenic patients is reported. Twenty outpatients suffering from classical rheumatoid arthritis and having rheumatoid factor titer equal to or greater than 1:64 were treated in a double-blind trial with imipramine 75mg or matching placebo. It was found that this dose of imipramine failed to affect the levels of rheumatoid factor. 4 references. (Author abstract modified)

252139 Gringras, M. Poynton, Cheshire, England A clinical trial of Tofranil in rheumatic pain in general practice. *Journal of International Medical Research* (Northampton). 4(2):41-49, 1976.

In a paper presented at the symposium on psychotropic drugs and pain, held at Stratford-upon-Avon, England, an evaluation of the clinical efficacy of imipramine (Tofranil) for relieving rheumatic pain was reported. A multicenter, double-blind clinical trial was conducted in general practice in which Tofranil was added to existing standard analgesic antirheumatic therapy in patients suffering from osteoarthritis, rheumatoid arthritis or ankylosing spondylitis. Twelve doctors admitted 65 patients to the trial. Fifty five patients completed an 8 week treatment period. According to clinical assessments, imipramine brought about statistically significant improvements in pain, stiffness, and grip strength and, according to patient self-rating, significant improvement in pain and stiffness. On the basis of a global assessment, patients showed a highly significant preference for imipramine compared with placebo as adjunctive therapy. 6 references. (Author abstract modified)

252142 Beaumont, G. no address The use of psychotropic drugs in other painful conditions. *Journal of International Medical Research* (Northampton). 4(2):56-57, 1976.

In a paper presented at the symposium on psychotropic drugs and pain, Stratford-upon-Avon, England, the use of psychotropic drugs in the management of chronic painful conditions is considered. It is noted that many advocates of the use of psychotropic drugs as analgesics have postulated an opiate sparing effect. Most of these studies, however, have

been uncontrolled and cannot answer the question of whether psychotropic drugs alter pain threshold or the appreciation of pain. It is recommended that this use of psychotropic drugs be further investigated. 4 references. (Author abstract modified)

252144 Trick, K. L. K. St. Andrews Hospital, Northampton, England The use of psychotropic drugs in a pain clinic. *Journal of International Medical Research* (Northampton). 4(2):68-72, 1976.

In a paper presented at the symposium on psychotropic drugs and pain, held at Stratford-upon-Avon, England, the use of psychotropic drugs in a pain clinic is discussed. The served patient population is divided into three categories: those with chronic organic lesions in whom the mental state is little affected; those with organic lesions who have had mental changes that influence their experience of pain; and those who have had primary mental changes in whom the complaint of pain is a symptom of their mental state. The importance of a full history taking for the correct diagnosis of the underlying disorder in these last two groups is stressed; and the use of psychotropic drugs to relieve the psychopathology indicated by diagnosis is described. It is recommended that the drug regimen be kept as simple as possible. The manipulative value of pain complaints is discussed in reference to those patients who complain of pain and yet evidence no depression and little anxiety. (Author abstract modified)

252181 Ogita, Kazuhiro; Yagi, Gohei; Itoh, Hitoshi; Miura, Sadanori; Lambert, Pierre-Albert. Department of Neuropsychiatry, School of Medicine, Keio University, Tokyo, Japan Comparative analysis of persistent dyskinesias of long-term usage with neuroleptics in France and in Japan. *Folia Psychiatrica et Neurologica Japonica* (Tokyo). 29(4):315-320, 1975.

To determine if there is a racial difference in long-term tolerance of neuroleptics, the prevalences and symptoms of persistent tardive dyskinesia in two mental hospitals, one in France and the other in Japan, were compared. The characteristics of the patients and the relationship of persistent dyskinesia to psychotropic medications were also considered. No difference was observed in prevalence. Higher incidence among elderly patients and a marked coexistence of chronic brain disorders were common to the populations of both hospitals. All cases presented a typical oral dyskinesia, but, in general, the symptoms in France were less intermittent and more pronounced than those in Japan. The two hospitals contrasted considerably in their use of psychotropic medicines. In France, incisive neuroleptics of the phenothiazine group were principally used as medication for chronic psychotics; while in Japan, although incisive neuroleptics such as perphenazine or haloperidol were used, their doses were relatively small, and a more frequent utilization of sedative neuroleptics was noted. 6 references.

252314 no author. no address /Drug research and the question of consent./ National Commission. *Law and Behavior*. 1(3):6-7, 1976.

A new area of inquiry undertaken by the National Commission for the Protection of Human Subjects in Biomedical and Behavioral Research focuses on drug research and the question of consent in prisons, mental institutions, and training schools. Money, the environment in the test facility, the effect participation will have on release, and the real desire for adequate medical services are all considered strong inducements to take part in drug research programs. The need for guidelines from the Commission on what constitutes coercion

is stressed. It is noted that final guidelines may result from a case filed by the National Prison Project of the American Civil Liberties Union to prohibit drug research in one correctional facility.

252315 no author. no address /Drugging to suppress behavior./ no title. *Law and Behavior*. 1(3):8, 1976.

The use of drugs to suppress behavior is considered in a letter to the editor. Court decisions are cited which establish the right to be free from indiscriminate, unsupervised, unnecessary, or excessive medication. Others are noted which hold that medication must not be used as a substitute for a program or used if it would hamper other programs. It is felt that legally mandated individual development plans cannot be wisely instituted if medication hampers observation and diagnosis. The possibility that medication may cause irreversible damage is discussed.

252444 Tariska, J.; Bolla, K. National Institute for Nervous and Mental Diseases, EGYT Pharmacoeconomic Works, Budapest, Hungary A new Hungarian psychopharmacopoeia. *Therapia Hungarica* (Budapest). 23(4):131, 1975.

A new Hungarian anxiolytic drug, Grandaxin, is introduced as a minor tranquilizer which has as its site of action the spinal synapses instead of the cortex. It thereby produces a tranquilizing effect without such unwanted accompanying secondary symptoms as drowsiness and dullness. Anxiolytic drugs are described as inhibiting the affective and emotional sphere, and were developed for use in situations where cortical sedatives, which inhibit perception and motor function, could not be used. Grandaxin is characterized as more potent and beneficial than previously developed anxiolytic products.

252859 Revusky, Sam; Parker, Linda A.; Coombes, Joseph; Coombes, Shannon. Memorial University of Newfoundland, St. John's, Newfoundland, Canada Rat data which suggest alcoholic beverages should be swallowed during chemical aversion therapy, not just tasted. *Behaviour Research and Therapy* (Oxford). 14(3):189-194, 1976.

A study was conducted with rats to determine whether patients in chemical aversion therapy treatment for alcoholism should actually swallow alcoholic beverages prior to the induction of sickness or whether they should simply swirl the beverages in their mouths. There were four pretraining procedures: A, in which rats drank sugar water prior to lithium sickness; P, in which sugar water was passed over the tongue prior to lithium sickness; Li, in which no taste experience preceded lithium sickness; NPT, in which the rats were exposed neither to the sugar water nor to lithium sickness. Lithium was then used to produce aversions to some other solution by dividing each of the pretraining groups into four subgroups. The solutions were novel NaCl, novel vinegar, novel alcohol, or familiar alcohol. Regardless of which solution was made aversive, the A pretraining procedure produced the strongest aversions and the Li procedure produced the weakest aversions. In the final phase, the preference for sugar water was tested. The A procedure produced far stronger aversions than the P procedure. Results suggest that alcoholic beverages should be swallowed, not just tasted, in chemical aversion therapy. 19 references. (Author abstract modified)

252955 Flemenbaum, Abraham. Department of Psychiatry, Texas Tech University School of Medicine, P.O. Box 4269, Lubbock, TX 79409 Pavor nocturnus: a complication of single daily tricyclic or neuroleptic dosage. *American Journal of Psychiatry*. 133(5):570-572, 1976.

The hypothesis was tested that a single bedtime dosage schedule of tricyclic or neuroleptic medication produces increased frequency of night terrors. A questionnaire was administered to 30 medical patients who were not receiving such medications and 100 psychiatric patients on either multiple or single dosage schedules. Psychiatric patients on multiple dosage schedules reported no more frightening dreams than the medical patients, whereas almost three fourths of those receiving single bedtime doses had frightening dreams, a significant difference from the medical sample. This preliminary report is presented to call attention to the possible undesirable effects of a single dose schedule. 11 references. (Journal abstract)

252990 Kaldor, A. Unit of Clinical Pharmacology, Semmelweis Medical University, Budapest, Hungary **Patterns and problems of drug consumption in a developing country.** *Clinical Pharmacology and Therapeutics*. 19(5):657-662, 1976.

The practice of drug storing in "home pharmacies" in Hungary is described, and the reasons for it are analyzed. In general, the categories of drugs (e.g., antibiotics, cardiovascular drugs, analgesics) consumed are the same as in the rest of Europe, the United States, and Latin America. Among the minor tranquilizers, the consumption of meprobamate has risen by about a third, chlorthalidone markedly, while phenobarbital consumption has remained about the same from 1969 to 1973. This is said to illustrate the pattern of an upward curve in consumption of a new drug, and the displacement of an old one. The overall rise of these drugs during this period was 72.1% in Hungary. Similar surveys are reported for oral hypoglycemic and antiarrhythmic drugs. Of hypotensive drugs, rauwolfia usage has declined and methyldopa has increased by over 200%. 3 references. (Journal abstract modified)

252991 Blackwell, Barry. Department of Psychiatry, Wright State University, Dayton, OH 45431 **Culture, morbidity, and the effects of drugs.** *Clinical Pharmacology and Therapeutics*. 19(5):668-674, 1976.

The thesis is advanced that in the evaluation of drug efficacy, despite the customary device of randomization, regional differences of prevalence of a given disease, unique culturally determined practices in treatment, and differential tolerances to side-effects are complicating factors in transcultural pharmacology that must be taken into account in the interpretation of efficacy and toxicity. This thesis is documented by illustrations from psychiatric practice, e.g., prevalence and morbidity of alcoholism, cultural differences as to prevalence, diagnosis, and symptomatology of schizophrenia, even to the point of widely discrepant diagnosis of a given patient, depending upon whether the examination was done by an American or British psychiatrist. Similar differences concerning the existence of disease entities other than psychiatric are cited, e.g., hepatic insufficiency considered common in some Latin populations; low blood pressure a recognized and treatable condition in Eastern Europe. The incidence of side-effects from the same drug may also vary in different cultures, making the interpretation of their significance difficult, and cross-cultural comparisons hazardous. To avoid some of these pitfalls, it is essential to recognize 1) the many complexities inherent in trials involving differing cultures and 2) to design the studies insofar as possible to include measurement of population variables. 19 references. (Author abstract)

253062 Kral, V. A. University of Western Ontario, London, Ontario, Canada **An overview of psychopharmacology of old age.** *Psychopharmacology Bulletin*. 12(2):51-52, 1976.

An overview of psychopharmacology of old age was presented at the Symposium on Psychopharmacology of Geriatrics held in March 1975 at the Reddy Memorial Hospital, Westmount, Quebec, Canada. It is contended that the psychopharmacology of the aged is complicated by a loss of efficiency of the metabolic organs of the body, concurrent diseases necessitating simultaneous administration of medication, and age linked symptomatological differences in the functional psychoses. It is reported that the mental disorders of the aged benefitting most from psychopharmacological treatment are the functional psychoses. The endogenous depressions respond both to tricyclic antidepressants and monoamine oxidase inhibitors. In the treatment of manic states, it is contended that neuroleptics are needed only at the beginning of treatment although careful screening is needed prior to administering lithium carbonate. It is shown that the treatment of aged schizophrenic patients is not essentially different from that of younger patients. Antidepressants and tranquilizers are recommended for patients suffering from one of the dementing processes of the senium.

253064 Schou, Mogens. Aarhus University, Psychiatric Hospital, Risskov, Denmark **A bibliography on the biology and pharmacology of lithium -- appendix II.** *Psychopharmacology Bulletin*. 12(2):69-83, 1976.

Appendix II of "A Bibliography on the Biology and Pharmacology of Lithium" by Mogens Schou, Professor of Biological Psychiatry, Aarhus University, Psychiatric Hospital, Risskov, Denmark is presented. The first Bibliography was published in the *Psychopharmacology Bulletin* in 1969 and was followed by Appendix I in 1972. These citations are the second part of Appendix II (Laborit-Rybakowski). The first part appeared in Volume 10, No. 1, 1976, and the last part will be published in Volume 12, No. 3, 1976. The citations are not confined to the English language and the majority were published within the last 5 years.

253103 Finzen, A. Niedersächsisches Landeskrankenhaus, 305 Wunstorf, Germany **Do psychiatric patients take their medication? The view of the staff.** *Nachrichten psychiatrische Patienten ihre Medikamente: die Sichtweise des Personals.* *Psychiatrische Praxis (Stuttgart)*. 2(3):183-188, 1975.

Thirteen doctors and 18 psychiatric nurses are surveyed concerning patients' compliance in taking prescribed medication during their stay in the hospital and after release. The opinion poll comprised 130 patients. The staff's opinion was found to depend on the treatment situation: in closed wards, noncompliance is thought to be extremely low, in day clinics extremely high. Open wards were thought to be somewhere in between. As a consequence, discharged schizophrenics are required to appear at the day clinic for medication. 12 references. (Journal abstract modified)

253374 Trethowan, W. H. University Department of Psychiatry, Queen Elizabeth Hospital, Birmingham B15 2TH, England **Pills for personal problems.** *British Medical Journal (London)*. 3(5986):749-751, 1975.

A discussion is presented of the problem of overprescription of psychotropic drugs by general practitioners and psychiatrists. Apart from a relatively small proportion of prescriptions given for family specific and recognizable types of psychiatric disorders, there does not seem to be evidence that psychotropic drugs are being increasingly prescribed to try and modify personal and interpersonal processes. While psychoactive drugs have undoubtedly contributed much to the treatment of psychotic disorders, using them to try to relieve

neurotic symptoms is in the long-term process likely to be self-defeating. Merely to suppress anxiety is to run the risk of suppressing the will needed to try and overcome the anxiety. It is concluded that, although overprescription of tranquilizers may not do all the physical harm to patients that might be expected, it undoubtedly harms the quality of medical practice. 3 references.

253529 no author. no address **Beta-blockers and the central nervous system.** Medical Journal of Australia (Glebe). 1(12):377-378, 1976.

Various aspects of the use of beta-blocking drugs were discussed in a symposium on beta-blockers and the central nervous system held in St. Moritz, January, 1976. It was noted that in subjects with an intact cerebral circulation, treatment with beta-blockers would not significantly affect everyday skills. An investigation of the side-effects of oxprenolol revealed that if circumstances were excluded which were an extension of its known pharmacological actions, it was very well tolerated. The use of beta-blockers in the treatment of anxiety states and in the management of depression and tremor were discussed as well as the possible value of beta-blockers in the prevention of cardiovascular disease. Although beta-blockers have not yet been shown to prevent coronary disease, they are likely to play an increasing role.

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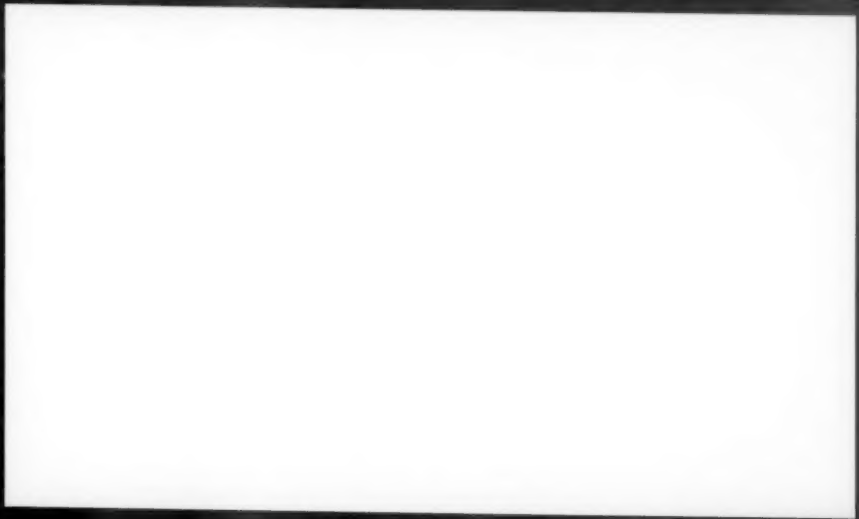
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